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THE BOOK OF NATURE:

EMBRACING

A CONDENSED SURVEY OF THE

Animal Kingdom

AS WELL AS SKETCHES OF

Vegetable, Anatomy, Geology, Botany, Mineralogy, &c. &c.

EDITED BY AN ASSOCIATION OF

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QUADRUPEDS.

GENUS FELIS. TYGERS.

PLATE **120.**



1. Felis Puma, Cougouar — 2. Felis Lynx, the Lynx — 3. Felis Uncia, Ounce — 4. Felis Caracal, Persian Lynx —
5. Felis Onca, Jaguar — 6. Felis Jubata, Hunting Leopard.

BOOK OF NATURE.

PLATE CXX.—QUADRUPEDS.

Genus Felis.

Fig. 1. *Congouar. Felis Puma. Felis Concolor*, Linn.

The length of the body of the puma is about four feet, and its height somewhat more than two feet. The tail is nearly two feet in length, without any tuft at its point. The head is round, the ears short; and the general colour of the fur brownish red. The belly is white, or pale cream colour. It has no mane, like the African and Asiatic lions.

The puma lives in high and mountainous tracts, which are covered with wood, in the warmer parts of the United States, and is common in South America. He is said to be fond of horse-flesh above other prey, but also feeds on all domestic, and also most wild animals which he is capable of overcoming. This species, although of small size, is extremely powerful; and, in attacking its prey, generally contrives to leap on the back of its victim, whom it seldom fails to vanquish. The wild ass is the only animal that can free itself of this hardy assailant, which it does by running against the low branches of trees, and by this means either kills the puma, or compels him to quit his hold. Another expedient is, to lie down, and roll over the puma; and thus not unfrequently, it crushes him to death.

Molina and D'Azara assert, that the puma will not attack man; but an incident related to Major Smith by Mr. Skudden, proves the contrary:—Two hunters having gone in quest of game to the Katskill mountains, state of New-York, each armed with a gun, and accompanied by a dog, they agreed to go in contrary directions round the base of the hill, which formed one of the points of that chain of mountains; and it was settled that, if either discharged his piece, the other should hasten to the spot from whence the report proceeded as speedily as possible, to join in the pursuit of whatever game might fall to their lot. They had not been long asunder, when the one heard the other fire, and, agreeably to promise, hastened to join his companion. He looked for him in every direction; but to no purpose. At length, however, he came upon the dog of his friend, dead, and dreadfully lacerated. Convinced by this, that the animal his comrade had shot at, was ferocious and formidable, he felt much alarmed for his fate, and sought after him with great anxiety. He had not proceeded many yards from the spot where the dog lay prostrate, when his attention was arrested by the ferocious growl of some wild animal. On raising his eyes to the spot from whence the sound proceeded, he discovered a large puma couching on the branch of a tree, and under him the body of his friend. The animal's eyes glared at him, and he appeared hesitating whether he should descend, and make an attack on the survivor also, or relinquish his prey, and decamp. The hunter, aware of the celerity of the puma's movements, knew that there was no time for reflection, levelled his piece, and mortally wounded the animal, when it and the body of the man fell together from the tree. His dog then attacked the wounded puma, but a single blow from its paw laid it prostrate. In this state of things, finding his comrade was dead, and knowing it was dangerous to approach the wounded animal, he went in search of assistance, and, on returning to the spot, he found the puma, his friend, and the two dogs, all lying dead.

The skin of this animal is preserved in the New York museum, as a memorial of the story.

A puma having been taken in the United States, was ordered to be shot, immediately after, while taking some food. The first ball penetrated his body, which merely had the effect of making him utter a loud growl; after which, he ate his food with the most savage voracity and keenness, swallowing along with it quantities of his own blood, till he sunk under exhaustion.

This animal, in a state of captivity, loses all its natural fierceness. Buffon mentions one, that would allow himself to be patted by the hand, and he would even permit children to mount on his back, without any attempt to scratch or bite them. There was one kept alive for some time, in the College of Edinburgh, which was very tame, although not completely domesticated. Mr. Kean, the celebrated actor, also had a tame puma, which died some time ago. This animal followed him, without exhibiting any proofs of wildness.

Fig. 2. *Lynx. Felis Lynx*, Linn.

The usual length of the lynx is about two feet six inches, its tail six, and its height sixteen inches. The ears are erect, and have a long pencil of black hairs at their tip. The fur is long, thick, and soft, of a grayish ash colour on the upper parts, with a reddish tinge, marked with dusky spots; the under parts are white, which differ much according to the age of the animal, as sometimes they are scarcely visible. The legs and feet are thick, short, and strong, covered with long fur; and the tail black at its extremity. The eyes are of a pale yellow, a colour not favourable to powerful vision, yet the creature is proverbial for its piercing sight. There was one of these lately in the Zoological Gardens of London, which had not any strong expression, or brilliancy of the eye; so that, in all probability, this is only one of the remains of ancient fable.

The fur of the lynx is valuable, on account of its great softness and warmth, and is in consequence an extensive article of commerce. It inhabits the northern parts of Europe, Asia, and America; and prefers cold or temperate climates, differing in this respect from most of the cat tribe. Lynxes conceal themselves in thick forests, prey upon stags, roebucks, hares, and other animals, and climb with facility up the highest trees after birds and squirrels.

The general disposition of this animal is like that of his congeners, and, like them, he may be tamed if properly treated.

Fig. 3. *Ounce. Felis Uncia.* Gmelin.

The ounce is smaller than the leopard, being only three feet and a half in length from the nose to the tail, and the tail itself about two feet and a half. He is long-backed, and short-legged. The hair is long, and of a light gray colour, tinged with yellow; somewhat lighter on the breast and belly; the head is marked with small round spots; behind each ear there is a large black spot; the back is beautifully varied with a number of oval figures, formed by small spots almost touching each other; the spots on the sides are more irregular; those on the legs and thighs small, and thinly dispersed; the tail is full of hair, irregularly marked with large black spots.

This animal is said to be more gentle in its manners than the leopard. It is a native of many parts of Africa, such as Barbary, Arabia, and Persia; and is to be found in Asia, as far as China. It is frequently trained to the chase, like the hunting leopard.

FIG. 4. *Persian Lynx. Felis Caracal.*

The Caracal, or Persian Lynx, is a native both of Asia and Africa; and it is said that in some parts of Persia it is tamed and made use of in the chase. It is an animal of great strength and fierceness: Dr. Charleton mentions one which killed a hound and tore it in pieces in an instant, notwithstanding the vigorous defence made by the dog. It is used not only in the chase of the smaller quadrupeds, but of the larger kinds of birds, such as herons, cranes, pelicans, &c. which it is said to surprise with great address. When it has seized its prey, it lies motionless for some time upon it; holding it in its mouth. The Caracal is about the size of a Fox, but of a much stronger make: its colour is a pale reddish-brown; whitish beneath: the head is small, the face longish, the ears sharp and slender, of a blackish colour, and terminated by a tuft or pencil of long black hairs.

In Barbary the Caracal is said to be of a paler colour, or less red than in India; and, according to an observation communicated by Mr. Bruce to the Count de Buffon, has the ears red on the outside, instead of black. This is considered by Mr. Pennant as a variety of the former, under the title of *Libyan Caracal.* He describes it thus: "Cat with short black tufts to the ears, which are white within: of a lively red without: tail white at the tip, annulated with four black rings, with some black marks behind the four legs. It is greatly inferior in size to the former; not larger than a common cat. Inhabits both Libya and Barbary."

FIG. 5. *Jaguar. Felis Onca.* DESMAREST.

The figure represented is the black variety of the jaguar, which has been denominated by naturalists the black tiger. This animal is of a uniform dark blackish brown on the head, and along the back, sides, and outer surface of the legs; the throat, breast, belly, and inside of the legs, being of a dark ash colour; the upper lip is white, furnished with long whiskers; above each eye it has very long and stiff hairs, and a black spot at the corner of the mouth; its ears are rather long and sharp pointed; and its paws white. In some specimens, the black jaguar is covered with indistinct spots.

The colour of the ordinary variety of the jaguar is of a brownish yellow, variegated on the upper parts of the body with open circles of black, with a central spot; the circles themselves disposed in five or six parallel horizontal lines; the thighs and legs are also spotted with black, but these have no central spaces; the breast and belly are very pale yellow, nearly approaching to white. The size of the jaguar is about the same as that of a large wolf; he is much more robust than the leopard; and his limbs are very powerfully made.

Jaguars are solitary creatures, living in pairs; inhabiting the thickly-wooded forests on the banks of rivers in South America. They are the most formidable animals of that country. They are very bold, and will attack cattle of all kinds, whom they seldom fail to conquer: horses seem to be their favourite food; but, when pressed by hunger, they will attack man. D'Azara mentions, that during his residence at Paraguay, six men were destroyed by these animals; two of whom were even seized and carried off in the night, while sitting by a blazing fire.

The jaguar is an excellent swimmer, and is said to attack and overcome the alligator, of whose flesh he is very fond.

As an instance of the physical powers of the jaguar, D'Azara mentions, that having heard of a horse being attacked by one, he hastened to the spot, where he found him dead, and part of the breast already devoured; but the jaguar had fled, on seeing him approach. He got the body of the horse dragged within musket-shot of a large tree, where he intended to pass the night, in hopes of shooting the jaguar, which he had no doubt would return to fetch its prey. He went away to prepare himself for the adventure, leaving a man concealed to watch the carcase. He had not been long gone before the jaguar made his appearance, from the opposite side of a broad and deep river, about sixty paces from the banks of which the horse lay. He approached, and, seizing it in his teeth, pulled it to the river, and swam across with his prey; dragged it out of the water, and drew it into a neighbouring wood.

M. Sonnini mentions, that in a journey through the extensive forests of Guiana, he, and the party by whom he was accompanied, were much annoyed by one of these animals, who continued to follow them in their route, for two successive nights; and who evaded every effort, on their part, to destroy him. They kept up very large fires to scare him, and he, at length, took his departure, after uttering a horrid howl of disappointment.

Expert climbers.—The astonishing powers of the jaguar in climbing lofty trees, is very remarkable. Some of the stumps of the mighty trees which compose the extensive forests of South America, are free from branches, to the distance of fifty feet from the ground, and the bark of some is nearly as smooth as glass. M. Sonnini observed, while travelling through that country, the marks of the claws of the jaguar at the top of some of the highest trees; and although it was quite apparent that the animal had slipped more than once, in his attempt to gain the branches, which was quite perceptible, from the deep ruts his claws had made in the bark, yet he had ultimately gained his object, no doubt in pursuit of some favourite prey.

FIG. 6. *Hunting Leopard. Felis Jubata,* LINN.

This animal is about the size of a large greyhound, and of a long make, with narrow chest, and long legs. It is a native of India, where it is tamed, and used for the chase of the antelopes and other animals; being carried into the field, chained and hooded, and, at the proper time, is loosened, when it is said to steal along the ground at first, concealing itself, till it gains a proper advantage, and then to dart on the animal it pursues, with several repeated springs. If it happens to miss its prey, it returns to the call of its master.

The following adventure took place in a frontier district of Southern Africa, in 1822, and was described by one of the two individuals so perilously engaged in it:

Two boors returning from hunting the hartebeest, (the *antelope bubalis,*) fell in with a leopard in a mountain ravine, and immediately gave chase to him. The animal at first endeavoured to escape, by clambering up a precipice, but, being hotly pressed, and slightly wounded by a musket-ball, he turned upon his pursuers, with that frantic ferocity, which, on such emergencies, he frequently displays, and, springing upon the man who had fired at him, tore him from his horse to the ground, biting him at the same time very severely on the shoulder, and tearing his face and arms with his claws. The other hunter, seeing the danger of his comrade, sprung from his horse, and attempted to shoot the leopard through the head; but, whether owing to trepidation, or the fear of wounding his friend, or the sudden motions of the animal, he unfortunately missed his aim.

The leopard, abandoning his prostrate enemy, darted with redoubled fury upon this second antagonist; and so fierce and sudden was his onset, that before the boor could stab him with his hunting-knife, he struck him in the eyes with his claws, and had torn the scalp over his forehead. In this frightful condition, the hunter grappled with the raging beast, and, struggling for life, they rolled together down a steep declivity. All this passed so rapidly that the other man had scarcely time to recover from the confusion into which his feline foe had thrown him, to seize his gun, and rush forward to aid his comrade, when he beheld them rolling together down the steep bank, in mortal conflict. In a few moments he was at the bottom with them, but too late to save the life of his friend, who had so gallantly defended him. The leopard had torn open the jugular vein, and so dreadfully mangled the throat of the unfortunate man, that his death was inevitable; and his comrade had only

ORNITHOLOGY.

Div.n 2.d Land Birds—Order 5.th GALLINÆ.



GENUS *DODO*.
(Dodo)
1.*Didus Ineptus*. HOODED D.

GENUS *STRUTHIO*.
(Ostrich)
2.3.*Camelus*. OSTRICH Male. 3.Female.

Lowry Sculpt.

the melancholy satisfaction of completing the destruction of the savage beast, which was already much exhausted by several deep wounds in the breast, from the desperate knife of the expiring huntsman.

PLATE CXXI.—ORNITHOLOGY.

Genus Dodo. Genus Strutho.

Fig. 1. *Hooded Dodo. Didus ineptus*, Linn.

Inhabits the Islands of Mauritius and Bourbon. This uncouth figure is rather larger than a swan, and not far short of three feet in length: the beak is strong, large, and hooked at the end; the gape stretches beyond the eyes; the colour of it very pale blue, except the end of the upper mandible, which is yellowish, with a red spot on the head of it; the end of the lower blackish: irides white: the general colour of the plumage is cinereous, and soft to the touch; the belly and thighs whitish: the head large, and seems as if it were covered with a black hood or cowl: the wings are very short, and of a yellowish ash-colour: the tail-feathers arched, stand up on the rump, and incline to yellow, like the wings: the legs have four toes, three before and one behind; are very short, and yellowish; claws black.

Figs. 2, 3. *Ostrich. Male and Female. Strutho Camelus*, Linn.

This gigantic species is at once the largest and most remarkable of this class, exceeding all birds in its extraordinary magnitude, often measuring upwards of eight feet in height, and as many in length, from the tip of the beak to the end of the tail, but to the top of the back it seldom exceeds four feet: its general appearance is peculiarly striking and attractive: its head is very small in proportion: its beak is four inches and a half in length, horn-coloured, with the tip dusky: the eyelids are fringed with hair: irides hazel: the head and greater part of the neck are flesh-coloured, destitute of feathers, but slightly covered with a few scattered hairs: the feathers of the lower part of the neck, and those of the body, are black, with their webs peculiarly constructed, being very loose and somewhat crisped in appearance: the quills and tail-feathers are of a pure snowy white, beautifully waving with the air, and some of them tipped and fringed with black: the wings have each of them two spurs, about one inch in length: the sides of the body and thighs are naked: the breast is armed with a hard callous substance: the legs are strong, of a grayish brown colour. The female differs in having those feathers brown that are black in the male.

Ostriches inhabit the sandy and burning deserts of Africa and Asia; they are oftentimes found in large flocks, and commit great ravages amongst corn-fields in the interior of the country about the Cape of Good Hope, where they are extremely numerous, as they are also in the neighbouring islands.

The Ostrich is one of the few polygamous birds found in a state of nature, one male being generally seen with two or three, and frequently with five females: it has been commonly believed that the female, after depositing her eggs in the sand, and there covering them up, trusts them to be hatched by the heat of the climate, and leaves the young ones to shift for themselves; but, however, it has been ascertained by recent observations, that no bird has a stronger affection for her offspring than this, and that none watches her eggs with greater assiduity, as she also does the young when newly excluded, they not being able to walk for several days, during which time they are regularly supplied with grass and water by the old birds, who likewise defend them from harm, and will even encounter every danger in their defence. The females which are united to one male, deposit all their eggs in the same place, to the number of ten or twelve each: these they hatch all together, the male also taking his turn of sitting on them: as many as sixty or seventy eggs have been observed in one nest, and according to the observation of Le Vaillant, ten or a dozen are always placed at a little distance from the nest; these are said to be intended for the first nourishment of the young: the nest appears to be only a hole in the ground, formed by the birds trampling the earth for some time with their feet. As a further proof of the affection of the Ostrich for its young, it is related by Thunberg, that he once rode past a place where a female was sitting on her nest, when the bird sprang up and pursued him, evidently with a view to prevent his noticing her eggs or young. Every time he turned his horse towards her she retreated ten or twelve paces, but as soon as he rode on again she pursued him, till he had got to some considerable distance from the place where he started her.

The Ostrich subsists entirely on vegetables, such as grass, fruit, grain, &c.: it will frequently swallow pieces of iron, lead, glass, copper, and such like, with the utmost voracity; but in the end such practices often prove fatal, as the bird is not capable of digesting them. Dr. Shaw asserts that he saw one at Oran that swallowed without any seeming inconvenience, several leaden bullets, as they were thrown upon the floor, scorching hot from the mould!

These birds being very valuable on several accounts, the natives use various stratagems to procure them: they hunt them on horseback, and begin their pursuit by a gentle gallop; for should they at the outset use the least rashness, the matchless speed of the game would immediately carry it out of their sight, and in a very short time beyond their reach; but where they proceed gradually, it makes no particular effort to escape. It does not go in a straight line, but runs first to one side and then to the other; this its pursuers take advantage of, and by rushing directly onward, save much ground. In a few days at most, the strength of the animal is exhausted, and it then either turns on the hunters and fights with the fury of despair, or hides its head and tamely submits to its fate. Another method of catching them, is by a man concealing himself in the skin of one of these birds, and by that means approaching near enough to surprise them. They are often taken alive, as they are easily tamed, and may be rendered very useful. Their skins are very thick, and are substituted for leather by the Arabians: their flesh and eggs are esteemed by many an excellent food, and their feathers even in this country are very valuable, and greatly used for ornament.

In procuring the eggs from the nest, the natives are very careful not to touch any with their hands, as the parent birds are sure to discover it upon their return, and not only desist from laying any more in the same place, but trample to pieces with their feet all those that have been left; a long stick is therefore always used to push them out of the nest. In the interior of the eggs there are often discovered a number of small oval-shaped pebbles, of a pale yellow colour, and exceedingly hard: Thunberg was informed that these are often set and used for buttons. The shell of the egg is frequently used for drinking-cups and other utensils, and is often set in gold for that purpose, being exceedingly hard, and equal in appearance to the finest ivory: it is also cut into small pieces and used for many ornamental purposes, such as rings and necklaces.

The great strength of these birds is exemplified in the following anecdote, related by Adanson, which took place during his residence at Podor, a French factory on the southern bank of the river Niger: he relates that "two Ostriches which had been about two years in the factory, and although young were nearly of their full size, were so tame that two little blacks mounted both together on the back of the largest: no sooner did he feel their weight, than he began to run as fast as possible, and carried them several times round the village, as it was impossible to stop him otherwise than by obstructing the passage. This sight pleased me so much, that I ordered it to be repeated; and to try their strength, directed a full-grown negro to mount the smallest, and two others the largest. This burden did not seem at all disproportioned to their strength. At

first they went a tolerably sharp trot, but when they became heated a little, they expanded their wings as though to catch the wind, and moved with such fleetness that they scarcely seemed to touch the ground. Most people have, one time or other, seen a partridge run, and consequently must know that there is no man whatever able to keep up with it, and it is easy to imagine that if this bird had a longer step, its speed would be considerably augmented. The Ostrich moves like the partridge, with this advantage; and I am satisfied that those I am speaking of, would have distanced the fleetest race-horses that were ever bred in England: it is true they would not hold out so long as a horse, but they would undoubtedly be able to go over the space in less time. I have frequently beheld this sight, which is capable of giving one an idea of the prodigious strength of an Ostrich, and of showing what use it might be of had we but the method of breaking and managing it as we do a horse."

In a tame state they are tractable and familiar towards persons that are acquainted with them, but are often fierce towards strangers, whom they will attempt to push down by running furiously upon them, and on succeeding in this effort, they not only peck at their fallen foe with their beak, but strike at him with their feet with the utmost violence: when thus engaged they make a fierce hissing noise, and have their throats inflated and mouths open; but at other times they have a kind of cackling voice, which they use when they have disabled an adversary. During the night they often utter a doleful and hideous cry, somewhat resembling the distant roaring of a lion, or the hoarse tone of a bear or an ox, as if they were in great agony.

They are fond of fanning themselves with their floating wings, which are generally in a quivering motion in hot climates, during the heat of the day, on the sunny side of a house, and seem at every turn to admire and be enamored of their own shadows.

PLATE CXXII.—ORNITHOLOGY.

Order PASSARES. Genus EMBERIZA.

FIG. 1. ***Whidah Bunting. Emberiza paradisea.*** LINN. ***Vidua Paridisea,*** CUV.

This singular bird is less than the hedge sparrow: beak lead-coloured: irides hazel: head, chin, and fore-part of the neck, back, wings, and tail, black: hind-part of the neck pale orange: breast and upper part of the belly the same, but brighter: lower belly and thighs white: vent black: two middle tail-feathers four inches long, placed vertically, undulated across, and more glossy than the others, broad, and ending in a long thread; the next two above thirteen inches in length, very broad in the middle, but narrow and rather pointed at the tips, with a long thread arising about the middle of the shaft; the rest only two inches and a quarter in length: legs flesh-colour: female wholly of a deep brown; but does not obtain the full plumage for three years: in the winter, the male resembles the young female.

This is common at Angola, Whidah, and other parts of Africa: it is often brought over to Europe, where it will live many years, and is a lively active little bird: it moults twice a year; and the male is without the long tail-feathers at least six months out of the twelve, as it first loses them about November, and in the spring they begin to reappear, but are not perfectly formed till June.

FIG. 2. ***Painted Bunting. Emberiza Ciris,*** LINN. ***Fringilla Ciris,*** CUV.

This most beautiful bird is the size of a hedge sparrow: beak gray brown: irides hazel: head and neck violet: orbits red: upper part of the back and scapulars yellow-green: lower part, rump, and all the under side, red: lesser wing-coverts violet-brown, with a red tinge: greater coverts dull green: quills brown, some of them with greenish edges, others red: tail brown; the two middle feathers reddish, and the rest edged with that colour: legs brown. Female above dull green: beneath yellow-green: quills brown, edged with green: tail brown, variegated with green.

As these birds do not obtain their full plumage till the third year, there are scarcely two to be found quite alike: in the first year both sexes are brown; in the second the male has a blue head, and the rest of the plumage blue-green, and the wings and tail brown, edged with blue-green: at that time the female inclines to blue. There is a variety of this bird, which has all the under parts yellowish, with the exception of a small red spot on the breast; the whole of which disappears, and turns to whitish after the following moult.

This bird inhabits various parts of America, from North Carolina to Guiana, and is one of the most beautiful of the genus: it builds its nest in the orange trees, and will feed on millet, succory, and other seeds; it has a very delicate and soothing song, which it delivers in a soft and warbling tone: it is often bred in Holland, and occasionally in England, in the manner of canaries; and will live in confinement eight or ten years. The Spaniards call it ***Mariposa***, and the English ***Nonpareil.***

FIG. 3. ***Shaft-tailed Bunting. Emberiza Regia,*** LINN. ***Fringilla Regia,*** CUV.

This bird is the size of a linnet: beak red: sides of the head, the under parts of the body, and round the neck, rufous: hind-part of the neck spotted with black: plumage above, lower part of the thighs, and vent, black: the four middle tail-feathers near ten inches in length, and webbed only for about two inches at the ends; the rest of them simple shafts, without the least appearance of a web; the other feathers even, short, and black: legs red: female brown, and without the long tail-feathers.

Like the rest of the long-tailed buntings, these birds moult twice in the year; and in the winter, the male becomes very similar to a linnet in colour.

Dr. Latham mentions having a specimen of this bird in his collection with only two kinds of brown, and no black on the plumage; the margins of the feathers being light brown, and the middle dark, not very unlike the back of the female house sparrow: the tail dusky, with pale rufous margins. Inhabits Africa, but is much scarcer than the whidah bird.

FIG. 4. ***Mustacheo Bunting. Emberiza provincialis,*** LINN.

Length near five inches: beak dusky: through the eye a streak of white, passing on each side of the neck; beneath which is a large spot of black: chin white: on each side of the throat from the under jaw, a black streak: upper parts of the body brownish red: breast, and sides, pale brown, spotted with black; rest of the under parts white; with a bar of that colour across the middle of the wings: quills dusky, edged with rufous; tail the same: legs pale brown. Inhabits Provence, where it is not uncommon: it is called ***Chic-gavotte*** and ***Chic-moustache:*** it feeds on grain, and is said to sing very agreeably in the spring.

FIG. 5. ***Black-throated Bunting. Emberiza Americana,*** LINN. ***Fringilla Americana,*** CUV.

This bird has the beak pale brown: the upper parts of the plumage ash-coloured, streaked on the back with brown: supercilia, and streak beneath the eyes, yellow: chin and throat white; with a triangular black spot on the latter: breast and middle of the belly yellow: sides streaked with dusky: greater wing-coverts tawny: quills and tail dusky, with paler edges: legs brown: female without the streaks above and beneath the eyes, and the spot on the throat; but with a dusky streak beneath the eye, and the space between the latter and the beak white.

This bird often appears in small flocks, and builds its nest on



GENUS *EMBERIZA*

(Bunting)

1. E. *Paradisea* VIDAH B. 2. E. *Ciris* PAINTED B. 3. E. *Regia* SHAFT TAILED B. 4. E. *provincialis* MUSTACHOE B. 5. E. *Americana* BLACK THROATED B. 6. E. *Hortulana* ORTOLAN B.

GENUS *LACERTA DRACO*
(Lizard)



1. *L. sincoides* 2. L. *chalcides* 3. L. *apus* 4. L. *draco*

AUSTRALASIAN GALLIWASP CHALCIDES L. APODAL L. FLYING DRAGON

G.P.

the ground, laying four or five white eggs, spotted with black: it has no song, but merely a chirp; and is a native of Hudson's Bay, where it is called *Outatapaseu.*

FIG. 6. *Ortolan Bunting. Emberiza hortulana*, LINN. and CUV.

This bird, which is rather less than the yellow-hammer, is very variable: it is in length six inches and a quarter: beak yellowish: head and neck cinereous olive, yellowish round the eyes: throat yellowish, with a cinereous border on each side beneath the jaw: under parts pale rufous, palest towards the vent: back and scapulars brownish chesnut, with the middle of the feathers blackish; towards the rump the chesnut predominates: wing-feathers brown, darkest in the middle; some of them with gray, and others with rufous edges.

This bird builds its nest in a low hedge, or on the ground; it is composed of dry bents, mixed with leaves, and is very carelessly constructed: the female lays four or five grayish eggs, and generally has two broods a year: it sings very prettily, and is often confined for that purpose. These birds are found over great part of Europe, but have not been taken in this country: in their passage from one part to the other, they are taken in great quantities for the use of the table, after being fattened for the purpose; which is very easily done, by putting them in a dark room with plenty of oats and millet, which will make them so very fat, as to kill them if the feeders did not: they are said to be one of the most exquisite morsels known: they then weigh about three ounces; and will often get fat by frequenting oat fields, but they are not so fine as when fattened artificially.

PLATE CXXIII.—AMPHIBIA.

Genus LACERTA. Genus DRACO.

The generic character of the *Lacerta Genus* is: body four-footed, elongated, tailed; without any secondary integument.

The generic character of the *Draco Genus*, or dragon, is: body four-footed, tailed, and furnished on each side with an expansile, radiated, wing-like skin.

FIG. 1. *Australasian Galliwasp. Lacerta Scincoides*, LINN. *Scincus Australasia*, CUV.

The general length of the galliwasp is nearly two feet, from the nose to the tip of the tail, which, like the body, is thick and strong, tapering pretty suddenly towards the tip: the limbs are short, and the whole appearance of the animal remarkably stout and plump: the teeth are small in front, but as they approach the back part of the jaws they gradually increase in size, and much resemble the molares in the Mammalia. The Galliwasp is a native of the American islands, and seems to be particularly common in Jamaica, where it is said to frequent woody and marshy districts. It is commonly of a palish brown colour, clouded with somewhat irregular bands of a deeper cast; but it is said occasionally to change its colour into a lively golden yellow.

The galliwasp, according to Browne, in his Natural History of Jamaica, is reckoned the most venomous reptile in that island, and it is said no creature can recover from its bite; but this he very properly considers as merely a popular error. It grows, according to that author, to two feet or more in length.

The Australasian Galliwasp is considered a variety of the preceding, with which it agrees in size and general appearance, but has larger scales, a longer tail in proportion, and is of a somewhat darker colour; the sides and tail being variegated with deep brown and somewhat irregular transverse bands, and on each side of the neck is commonly a longitudinal brown spot or patch. It is a native of New Holland, and is very accurately figured in Mr. White's Journal. The tongue in this, as well as in the other Scinks, is short, flat, rounded, and entire; not forked as in most Lizards.

FIG. 2. *Chalcides Lizard. Lacerta Chalcides*, LINN. *Seps Chalcides*, CUV.

The Chalcides is a native of many of the warmer parts of Europe, as well as of Africa, and is found of different sizes, from the length of a few inches to that of a foot, or even more. Its general length, however, seems to be eight or nine inches. The head is covered in front with large scales, and is terminated by a slightly tapering, but not pointed snout: the eyes are small, and the openings of the ears very distinct: there is, properly speaking, no neck, the diameter continuing nearly equal from the head to the beginning of the tail, which is often longer than the body, and gradually tapers to a small point: the legs are very short, and the feet still more so in proportion, consisting each of three toes, terminated by minute claws: the scales, on every part of the body, legs, and tail, are of a shape nearly resembling those of the Scinks, lying smoothly over each other in the manner of those of a fish: the colour of this animal is pale ferruginous or chesnut brown, lighter or of a yellow brown beneath: along the back are six deep brown lines or narrow bands, viz. two somewhat distant ones down the middle, and two approximated ones down each side: in the living animal the colour is generally said to have a kind of metallic or brassy cast, which seems to have given rise to the old name *Chalcides* and *Chalcidica*. This singular Lizard is described by Linnæus as having the feet furnished with five toes, but whatever may have been the case with the individual specimen which he examined, it seems pretty certain that the general number is three.

The Chalcides is an animal of a harmless nature, frequenting moist shady places, moving rather slowly, and feeding on insects, small worms, &c. It is a viviparous species, and is said to produce a great many young. The serpents to which it bears the nearest alliance, in point of form, are those of the genus *Anguis*, and particularly the *A. fragilis*, or common *Slow-Worm.*

FIG. 3. *Apodal Lizard. Lacerta Apus*, LINN. *Pseudopus Pallasii*, CUV.

A still nearer approach is made to the snake tribe by this large and singular Lizard, than even by the Chalcides. It is a native of Greece, the southern parts of Siberia, and doubtless of many other parts of Europe and Asia, though it seems to have been but recently known to naturalists, Dr. Pallas, who discovered it in the south of Siberia, having been its first describer. It is found of the length of near three feet, and so perfectly resembles the general form of a large snake, that it is not without a near inspection that it is ascertained to belong to the race of Lizards; being furnished merely with a pair of very short and somewhat acuminated processes by way of feet, situated at a vast distance from the fore parts of the body, nearly on each side the vent: the processes have no divisions or toes, but seem to form one simple projection, with a slight indenture only: the head is rather large, and covered with large scales: the snout rather taper; the upper jaw somewhat projecting over the lower: the mouth moderately wide: the ears very conspicuous: there is no appearance of neck; the body tapering in the most gradual manner from the head to the end of the tail, which is longer than the body, and terminates in a point. The whole animal is covered with longitudinal rows of moderately large scales with emarginated tips, and so disposed as to form so many prominent or carinated lines along the surface, in consequence of which a transverse section of the body, in any part, presents a multangular outline. Along each side of the body, from the head to near half the length of the tail, runs a deep continued furrow or channel. The colour of this Lizard, is a pale chesnut or ferruginous above, and pale yellow-brown beneath. It is singular that an animal of so large a size should so long have remained unknown to systematic naturalists. It frequents moist and shady places, and appears to be of a harmless character.

FIG. 4. *Flying Dragon. Lacerta Volans*, sive *Lacerta Draconculus*, LINN. *Draco Vulgaris*, CUV.

The very name of this genus conveys to the mass of mankind the idea of some formidable monster, and recalls to the imagination the wild fictions of romance and poetry; but the animal distinguished by that title in modern natural history is a small and harmless Lizard, agreeing in the general form of its body with the rest of that tribe; but furnished with large, expansile, cutaneous processes, covered, like the rest of the animal, with small scales, and strengthened internally by several radii or ribs, extending to the extreme verge of the membrane, and giving the power of contraction and dilatation. As this is a circumstance which separates it from the rest of the Lizard tribe, Linnæus was induced to institute for it a distinct genus.

The total length of this highly curious creature is commonly about nine or ten inches, or at most a foot; the tail being extremely long in proportion to the body, which does not measure more than about four inches in length. The head is of a very singular form, being furnished beneath with a very large triple pouch or process, one part of which descends beneath the throat, while the two remaining parts project on each side; all are sharp-pointed, and seem analogous in some degree to the gular crests of the Guiana and other Lizards, but are still more conspicuous in proportion to the size of the animal. The head is of moderate size; the mouth rather wide; the tongue large, and thick at the base; the teeth small and numerous; the neck rather small; the body and limbs somewhat slender, and universally covered with small acuminated and closely-set scales, which incline more to a minutely aculeated appearance on the tail. The colour of the Dragon on the upper parts is an elegant pale blue, or bluish gray, the back and tail being marked by several transverse dusky undulations or bars, while the wings are very elegantly spotted, more especially towards the broadest part, with differently-shaped patches of black, deep-brown, and white: the border of the wings is also white, and the whole under surface of the animal is of a very pale or whitish brown colour.

The Dragon is an inhabitant of many parts of Asia and Africa, where, like most of the smaller Lizards, it delights in wandering about trees, and from the peculiar mechanism of its lateral membranes, is enabled to spring from bough to bough, and to support itself in air for some short space, in the manner of a flying squirrel, or even of a bat. It feeds on insects, and is in every respect an animal of a harmless or inoffensive nature.

It may not be improper here to add, that all the other animals described and figured in the works of some of the older naturalists, under the name of Dragons, are merely fictitious beings, either artificially composed of the skins of different animals, or made by warping some particular species of the Ray or Skate tribe into a dragon-like shape, by expanding and drying the fins in an elevated position, adding the legs of birds, &c. and otherwise disguising the animals. Such also are the monstrous representations (to be found in Gesner and Aldrovandus) of a seven-headed Dragon, with gaping mouths, long body, snake-like necks and tail, and feet resembling those of birds. These deceptions appear to have been formerly practised with some success; and misled not only the vulgar, but even men of science. Of this a curious example is said to have occurred towards the close of the seventeenth century.

The most remarkable instance, in later times, is that of a Dragon of the kind above-mentioned, which was in possession of a merchant at Hamburg, and which was considered by its proprietor as of the value of 10,000 florins; but which the penetrating eye of Linnæus, during his visit to that city, soon discovered to be a mere deception, ingeniously contrived by a dexterous combination of the skins of snakes, teeth of weasels, claws of birds, &c. being, as Linnæus himself expresses it, "*non Naturæ sed artis opus eximium.*" It is said that Linnæus, in consequence of this discovery, was obliged to fly from Hamburg, in order to avoid the wrath of the enraged proprietor, who determined on a prosecution against him, as having injured the reputation of his property. An exact representation of this curious imposture is given by Seba, who, however, does not, as commonly supposed, describe it as a really existing species, but merely as so reported. It would be scarcely excusable to swell the number of plates in the present work, by an introduction of this figure, merely to elucidate the anecdote: it is, therefore omitted.

PLATE CXXIV.—ICHTHYOLOGY.

Order JUGLARIS.

FIG. 1. *Gadus morhua*, LINN. and CUV. Common Cod.

The Cod attains to the length of four or five feet, and sometimes rather more. The body is of moderate thickness, with the abdomen prominent; the head of middling size, with the opening of the mouth large, and the jaws and palate armed with numerous sharp teeth: the colour of the body variable, according to the age of the fish, in general cinereous on the head and sides, and spotted more or less conspicuously with dull yellow: the lateral line broad and whitish.

The Cod is a creature of most voracious appetite, frequently preying on its own species; and its digestion so powerful, as to dissolve many of the harder substances, which it devours. It is a highly prolific fish, nearly a million of eggs being sometimes contained in a single roe.

This well-known species occurs in immense abundance throughout all the northern seas of Europe, in the vicinity of the polar regions, from whence they migrate towards the south, at particular seasons, in quest of food. Though there are many extensive fisheries of Cod, in the north of Britain and Ireland the principal are those carried on upon the banks of Newfoundland, the concerns of which are truly prodigious. They are taken only with the hook and line; and being cured, or salted, and dried upon the spot, are thence transported to the continent of Europe.

FIG. 2. *Gadus Carbonarius*, LINN. *Merlangus Carbonarius*, CUV. Coal-fish.

The Coal-fish is an inhabitant of many of the rocky coasts of Britain, and is especially abundant towards the northern parts of the island, as it is also throughout the north and Baltic seas, and even, according to Gmelin, in the Pacific ocean. In different stages of growth, the colours of this fish vary considerably. When young, a certain duskiness prevails in the colours, which becomes darker as the fish grows older; and when they have attained their full size, which is from about two to three feet, the back, nose, dorsal fins and tail, oftentimes appear of a deep black: under the pectoral fins, is a black spot: the mouth is also of the same colour, and the tongue silvery.

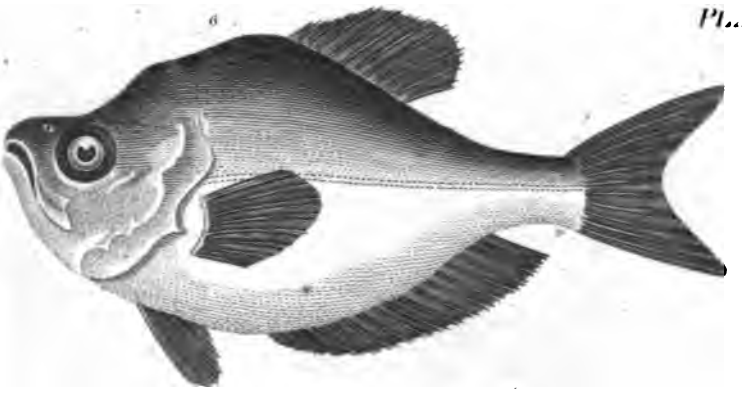
FIG. 3. *Gadus minutus*, LINN. and CUV. *Poor.*

This species is a native of the European and Mediterranean seas; length six or seven inches, and of a somewhat elongated form: the body silvery, spotted with black: back brownish-yellow, and gill-covers punctured; the lower jaw is shorter, with fewer rows of teeth; the eyes round and silvery, and pupil black; the lateral line narrow and straight, and the tail forked.

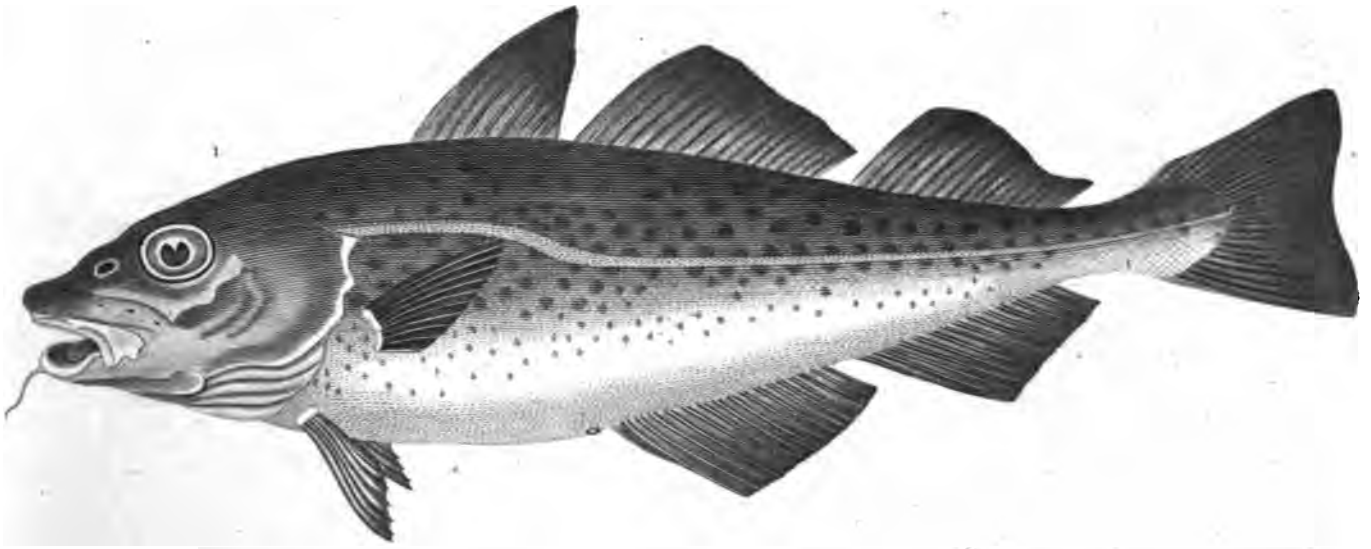
The appearance of this little fish in the Mediterranean, excites great joy among the fishermen, as it announces an abundant fishery, the shoals of the Poor being immediately followed by an immense multitude of the voracious fishes, among which the cod, the dorse, and the haddock, are the most considerable.

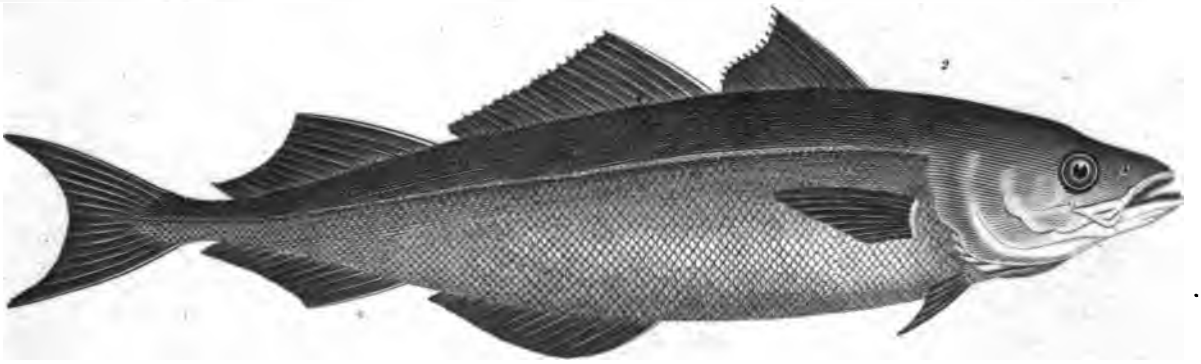
FIG. 4. *Gadus tau*, LINN. *Batrachus tau*, CUV.

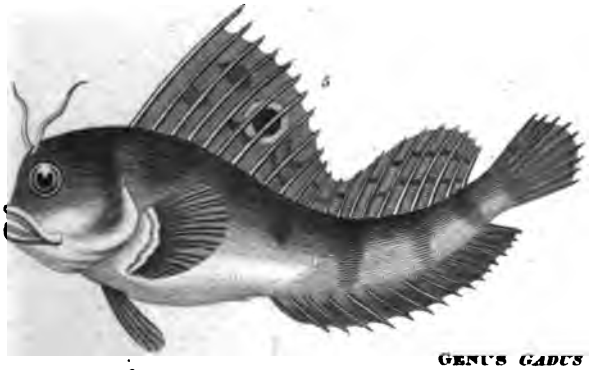
Said to inhabit Carolina, where it is called the toad-fish. The body is smooth and mucous, above brown, beneath whitish;

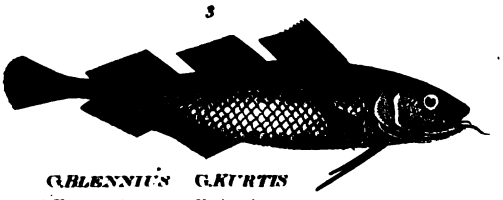












GENUS *GADUS* — GBLENNIUS — G.KURTIS

1.G. *morhua* — 2.G. *carbonarius* — 3.G. *minutus* — 4.G. *lau* — 5.B. *maris* — 6.K. *indicus*

Cod — Coal Fish — Poor

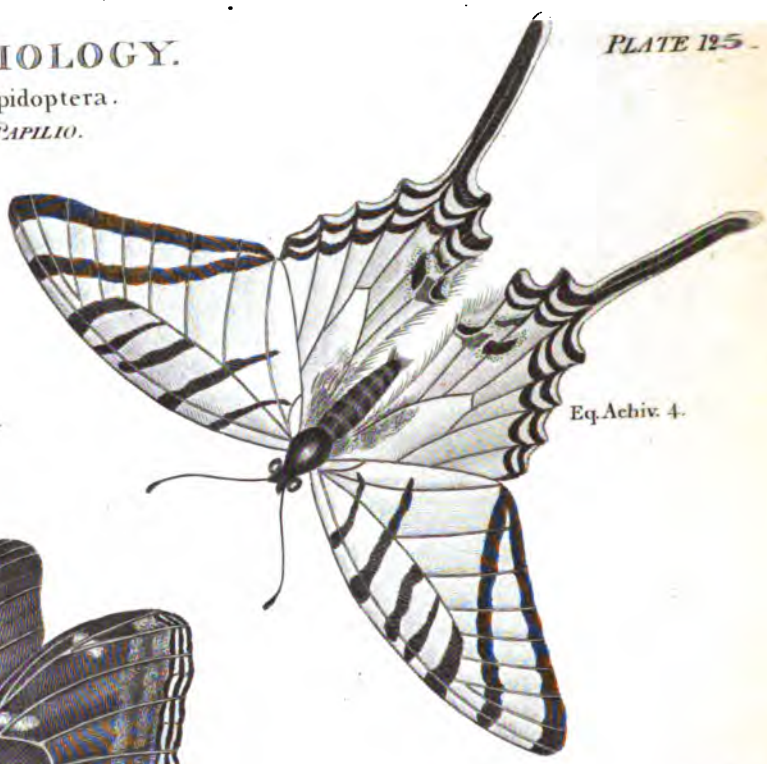
ENTOMOLOGY.

Order Lepidoptera.

Genus PAPILIO.



Eq. Troës. 1.



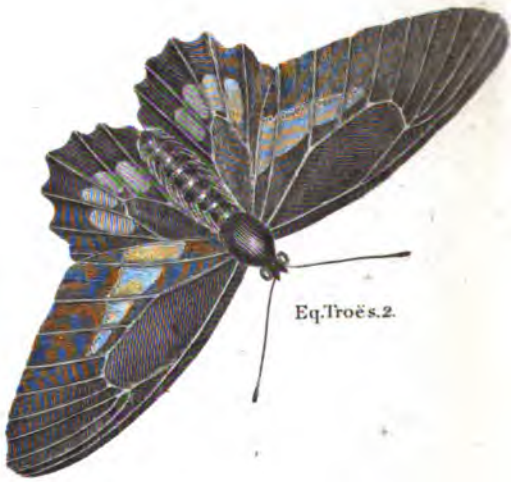
Eq. Achiv. 4.



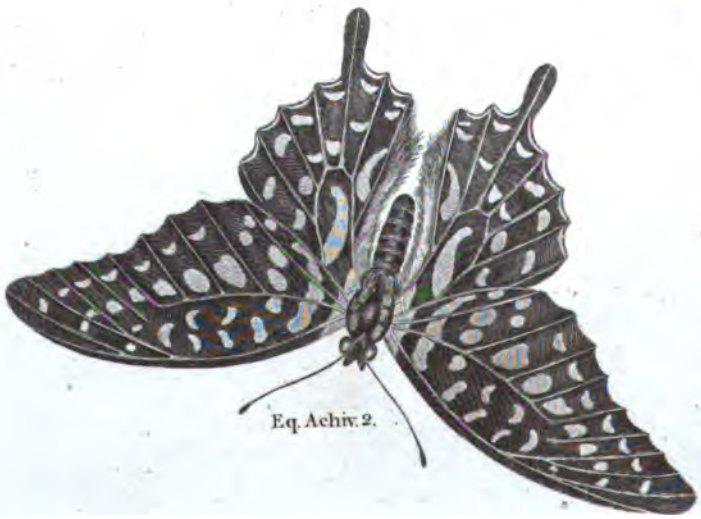
Eq. Achiv. 1.



Eq. Achiv. 5.



Eq. Troës. 2.



Eq. Achiv. 2.



Eq. Achiv. 3.

C. Mumm. fc.

ENTOMOLOGY.

Order Coleoptera.

GENUS *CERAMBYX – G. PRIONUS – G. LAMIA – G. CLYTUS.*

G. SAPERDA – G. RHAGIUM.



S.collaris.



C.imperialis.



L.quadrimaculata.

P.longimanus.

R.bifasciatum.



C. thoracicus.



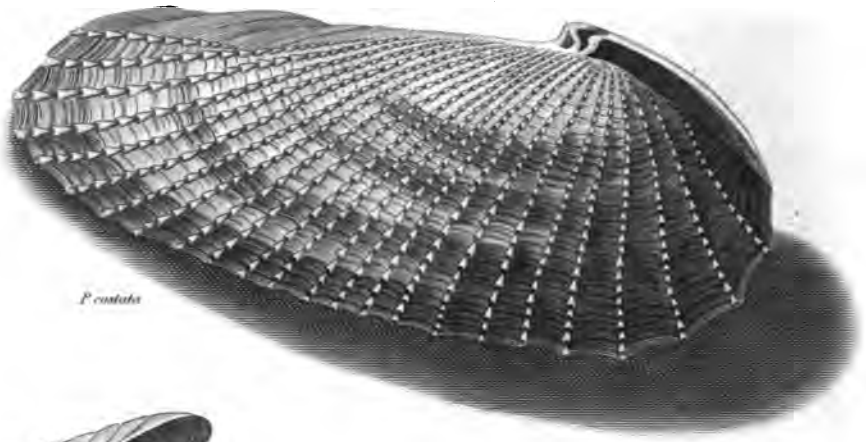
P.unidentatus.

S.nigro-virens.

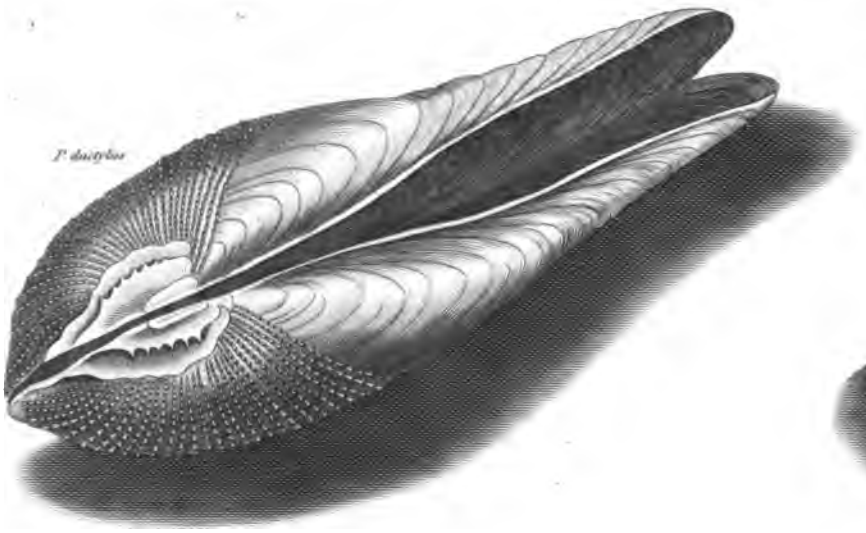
G.M.



P. striata



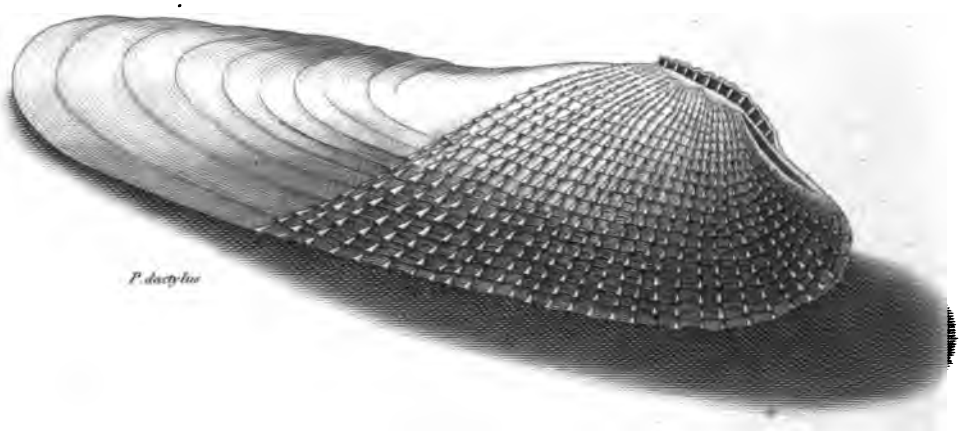
P. costata



P. dactylus



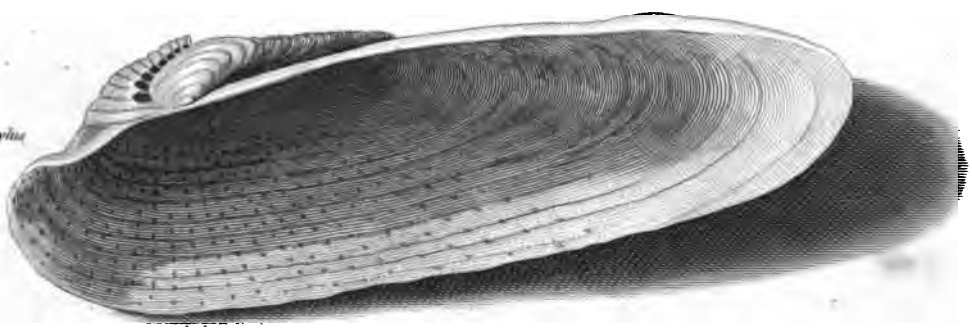
P. striata



P. dactylus



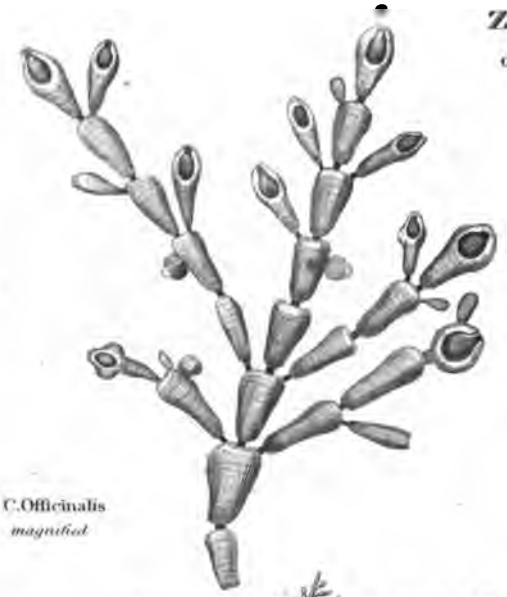
P. striata



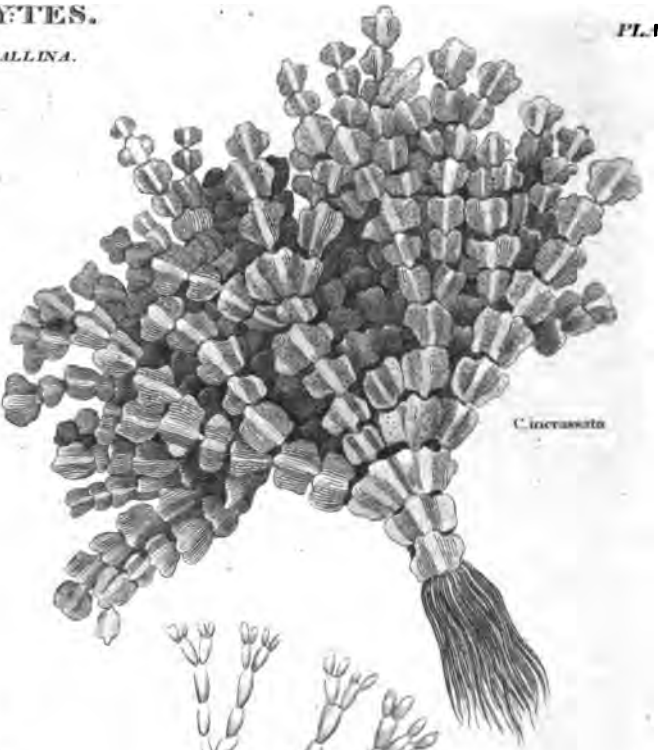
P. dactylus

ZOOPHYTES.

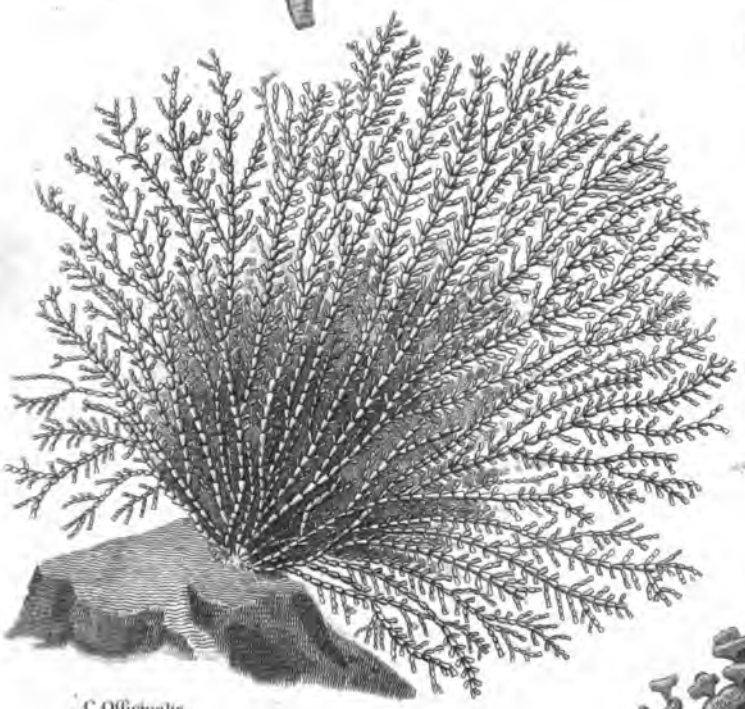
GENUS *CORALLINA.*



C.Officinalis
magnified



C.incrassata



C.Officinalis



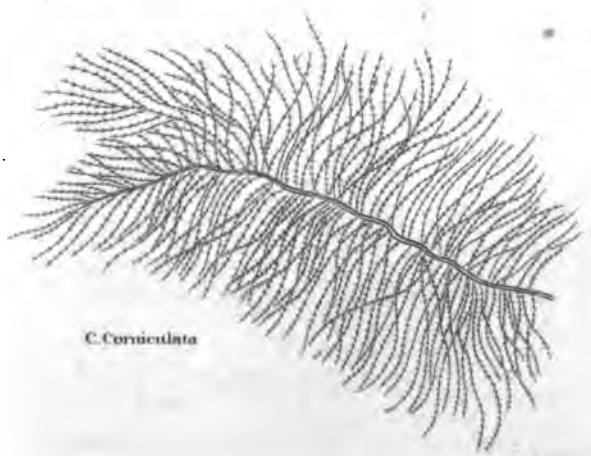
C.Corniculata
magnified



C.Squamata



C.Opuntia



C.Corniculata



C.Squamata
magnified

back and fins spotted with white, and covered with soft, thin, very small, brown scales of a rounded form, and edged with white: the head large and broad; the eyes vertical and large, pupil black, iris golden; and on each side a double row of small tubercles: between them and the nape, a cavity and transverse yellow streak: palate each side with a double row of teeth: gill-covers of two pieces, the membrane large and loose: the pectoral and ventral fins are pointed, the first ray of the posterior one strong, rigid, and very long: tail rounded, with the rays forked.

FIG. 5. *Blennius maris*, LINN. and CUV.

Head crested, sloping, six rays in the quill-membrane: body lanceolate; ventral fins of two united rays: anal fin distinct: inhabits the Mediterranean.

FIG. 6. *Kirtus indicus*, LINN. and CUV.

Body carinated each side, the back elevated, and the gill-membrane furnished with two rays: the body is short, slender, golden, and appearing as if covered with silvery plates: the head is large, compressed and obtuse: eyes very large, with black pupil, and iris above blue, beneath white: mouth large: jaws with numerous teeth: tongue short and cartilaginous; lateral line straight, and commencing above the pectoral fin: first ray of the dorsal and ventral fins hard, and two first of the anal spinous.

PLATE CXXV.—ENTOMOLOGY.

Order LEPIDOPTERA.

Antennæ thickening towards the extremity, commonly terminating in a knob or clavated tip; wings when sitting erect, and meeting upwards: they fly in the day-time.

The first Linnæan division of this order, consists of *Equites*, which are distinguished by the shape of their upper wings: these are longer, if measured from their posterior angle to their anterior extremity, than from the same point to the base. Some of this division have filiform or sharpened antennæ, in which they resemble moths, but may commonly be distinguished by their habit, or general shape. The Equites are denominated *Troes* or *Trojans*, distinguished by having red or blood-coloured spots or patches on each side of their breasts; or *Achivi*, *Greeks*, without red marks on the breast, of gayer colours, in general, than the former; and frequently having an eye-shaped spot at the inner corner of the lower wings.

The figures in the plate are intended to represent the characters in the several divisions, without reference to particular species.

PLATE CXXVI.—ENTOMOLOGY.

Order COLEOPTERA.

Saperda Collaris, LINN. and LAT.

Black, thorax encircled with four white rings; side of the wing-cases, spot at the tip, and body beneath, covered with white down. Inhabits New South Wales.

Cerambyx imperialis, LINN. *Lamia imperialis*, LAT.

Head large, obtuse, declining: eyes kidney-shaped, and embracing the base of the antennæ: thorax cylindrical and uneven: wing-cases as long as the abdomen: body cylindrical. Feelers four, filiform: jaw horny and bifid: lip cleft and horny.

Lamia quadrimaculata, LINN. and LAT.

Prionus longimanus, LINN. *Acrocinus longimanus*, LAT.

Thorax armed with formidable spines: wing-cases with a single tooth at the base, and bidentated at the tip: antennæ and fore legs very long. This is an insect of large size, the body exceeding three inches in length, and having the antennæ, and first pair of legs, remarkably long in proportion: the colour is pale whitish-gray, varied with yellow and orange, and a number of black interrupted lines. A beautiful species: inhabits South America.

Rhagium bifasciatum, LINN. and LAT.

Thorax spinous: wing-cases with two oblique yellow spots. Inhabits Europe.

Clytus thoracicus, LINN. and LAT. Thorax black, with a rufous spot: wing-cases fulvous; suture at the base, and two oblique bands black. Inhabits New Holland.

Saparda nigro-virens, LINN. and LAT. Blackish-green; thorax with rufous characters: wing-cases rough, with a testaceous spot at the base: sides yellow: tip truncated and bearded. Inhabits New South Wales.

Prionus unidentatus, LINN. and LAT. Thorax somewhat margined, unarmed, black and downy: wing-cases chesnut, clouded with yellow, and with a single tooth at the apex, with four elevated lines. Inhabits New Holland.

PLATE CXXVII.—CONCHOLOGY.

Genus PHOLAS.

Shell bivalve, divaricate, with several lesser differently shaped accessory ones at the hinge; the hinge recurved, united by a cartilage: in the inside, beneath the hinge, is an incurved tooth. The inhabitants of this genus all perforate clay, spongy stones, and wood, while in the younger state; and as they increase in size, they enlarge their habitation within, and thus become imprisoned. They contain a kind of phosphoric liquor, of great brilliancy in the dark, which illuminates whatever it happens to fall on.

The word Pholas is derived from the Greek, and signifies no more than any thing which is hidden; the name was given to this genus of shell-fish from their custom of making themselves holes in earth, sand, stones, or wood, and living hidden in them. Many being of opinion that these could not work themselves into the substance of hard stones, have thought that they were hatched in holes, accidentally formed in stones, and that the shells naturally grew of such a shape as was necessary to fill the cavity. Nor is this the only error propagated concerning the Pholas; for as all that was signified by the name being only that the shell was hidden in some solid substance, whenever an author found a shell-fish of whatever kind thus buried in stone, he described it under the name of pholas.

Pholas costata, LINN. and CUV. Shell ovate, and striate with elevated ribs. White, almost six inches long: ribs oblique, and armed with elevated scales or obtuse spines. Inhabits the American seas.

Pholas striata, LINN. and CUV. Shell ovate, and multifariously striate. The striæ are occasionally decussate: the part near the hinge is glabrous, and without striæ.

Found in some of the southern parts of Europe, and India, and on the coast of Barbary.

Pholas dactylus, LINN. and CUV. Shell oblong, with reticulate sub-spinous striæ on the upper part. Five inches long: entirely white, with sometimes an ochraceous cast, thin, fragile, elongated, and wedge-shaped on the fore part, convex behind, the margin inflected: the hinge resembles a spoon, and there are four accessory valves: found among the rocks of Europe, and shines by night.

PLATE CXXVIII.—ZOOPHYTES.

Genus CORALLINA.

The corralines adhere to rocks or other solid bodies, and are concretions formed by the polype animals which inhabit them the coralline itself being only the habitation of these creatures,

The branches are generally elevated, of a shrub-like form, and exhibit an elegant appearance from the symmetry and general proportions of their respective articulations; the branches being composed of little joints, like beads strung in a necklace. The joints consist of a calcareous and gelatinous matter, and have the surface perforated or full of minute pores, which in many species are so very small as to be visible only with the aid of glasses. It is in these minute cells that the polypes reside, and through which they either protrude their limbs when they lie in wait for food, or draw their nourishment through the aperture. When a branch of coralline is immersed in vinegar, the calcareous crust dissolves, and leaves the cartilaginous parts uninjured, and by that means enables us to examine its internal tubular structure. In point of colour the corallines differ very considerably, not only in different, but also in the same species, and, without exception, the whole become white on exposure to air.

Corallina officinalis, Linn. and Cuv. Sub-bipinnate, and usually trifidly branched, with the joints of the stem somewhat wedge or top-shaped: those of the branches round, and some of the terminal ones headed.

Common on almost every shore, where it grows on the rocks in tufts of two, three or four inches in length, and varying considerably in colour, being red, yellow, green, and white. This is the coralline of the shops, and is the kind used in powder as an absorbent.

Corallina incrassata, Linn. and Cuv. Trifidly branched, with compressed plano-convex wedge-shaped joints.

This species is very frequently cast up on the shores of the American islands, particularly Jamaica.

Corallina comiculata, Linn. and Cuv. Forked, with the joints of the stem and branches doubly-horned; those of the sub-divisions roundish. Inhabits the European seas.

Corallina squamata, Linn. and Cuv. Three-forked, the joints of the stem roundly compressed and wedge-shaped, those of the branches flatly compressed: terminal ones, flattish and sharply two-edged. Inhabits European coasts, and is of a sea-green colour.

Corallina opuntia, Linn. and Cuv. Three-forked, with kidney-shaped joints waved at the edges.

This species grows on the coast of Jamaica, and other West India islands, and is found also in the Mediterranean sea. The colour is white, and the joints somewhat kidney-shaped.

PLATE CXXIX.—BOTANY.

Fungi.

Merulius eburneus, Linn. The plants of this genus have been called by some authors *Metulius*, from *Meta*, a pillar or boundary-post with a round top, which their shape resembles. The cap is fleshy or membranous: receptacle veiny, with superficial swelling plaits.

Auricularia reflexa, Linn. This mushroom derives its name from the resemblance which it bears to the human ear. It grows on old elder-trees.

Nidularia Campanulata, Persoon. A small species, grows in clusters in moist weather in old neglected garden-beds.

Tuber cibarium, Linn. A subterraneous solid fungus, chiefly indigenous to the south of Europe, called the Truffle, a delicious article of food, sought for with great avidity; in which pursuit, hogs, trained for the purpose, are often employed. Said to have been found in Easton, (Penn.) by a German hunter.

Cyathus minutus, Persoon. A very small fungus, deriving its name from the resemblance which it bears to a wine-glass.

Found all over the world: parasitic upon decayed vegetable substances, and the fibrous roots of plants.

Trichia, Linn. So called from the resemblance of the stipes to hairs. These are minute, clustered, pulverulent fungi, commonly inhabiting the under surface of the decayed bark of trees.

Sphæria, Linn. Minute, sessile, spherical or oblong pulverulent fungi, inhabiting the diseased bark of trees and shrubs, resembling to the naked eye so many small immersed black dots scattered over and below the surface of the branches. The species are very numerous.

Uredo, Linn. These fungi (at least some of the species) are well known by the name of *Smut*, and are commonly found infesting the leaves and seeds of grain, to which they communicate a very deleterious quality, and if abundant, succeed in destroying the plant.

Aecidium, Linn. A small cup-shaped fungus, often of a yellow or orange colour, inhabiting the under surface of the leaves of various plants, as well as their fruits: one of the species commonly succeeds in destroying the gooseberry crops in moist seasons.

Phizomorphia, Linn. So called from its resemblance to fibrous roots, generally inhabiting the under surface of the decayed bark of trees, beneath which it spreads uninterruptedly for many fathoms.

The Fungi form an extensive family; many of them are commonly called *mushrooms*. These plants vary greatly in size, form, colour, and consistence. They frequently have the form of a parasol, or are filamentous, membranaceous, tuberous, froth-like, &c. They are found of all colours except green, but their prevailing hue is grayish white, or yellowish. Their consistence is coriaceous, fleshy, spongy, gelatinous, corky, or ligneous, but never herbaceous. They are destitute of leaves or flowers, and differ much in their appearance from other plants. Their anatomical structure, when examined with the microscope, is found to consist entirely of cells, some rounded, and others more or less elongated. When arrived at maturity, they all present certain minute coloured globules, which are considered reproductive, and analagous to the seeds of other vegetables. The abundance of these globules in some fungi is incalculable; 2400 species of fungi are now known, which are distributed into 80 genera.

No other vegetables grow and develop themselves so quickly as fungi. It is not unusual to see hundreds of them, which have sprung up in the course of a single night. It is well known how rapidly mould, which is fungus, covers certain substances; some species in a few minutes pass through the whole course of their existence; others live only a few hours; but their duration is generally several days, and even a season, and some continue for many years, but these are composed of several successive generations.

They delight in moist, shady places, and grow on all animal and vegetable substances in the state of decomposition, on dead and living trees, on the leaves of all plants, under the surface of the earth; none, however, are truly aquatic, though some float on the surface of fermented liquors. Some fungi grow even in the interior of vegetables, and in this respect are analagous to intestinal worms. All possess a peculiar odour, by which their presence may be recognized.

Their taste is insipid, or sometimes nauseous, acrid, styptic or caustic, and in some of the edible species very agreeable. Many species of mushrooms have been used for food from time immemorial in China, India, and Africa, and more recently in Europe, where some species are cultivated for the table in vast quantities.

In some parts of Italy, the inhabitants have been at times reduced entirely to this aliment.

Many species are extremely poisonous, and the greatest care should be taken in the selection before they are prepared for the table.

Fungi.



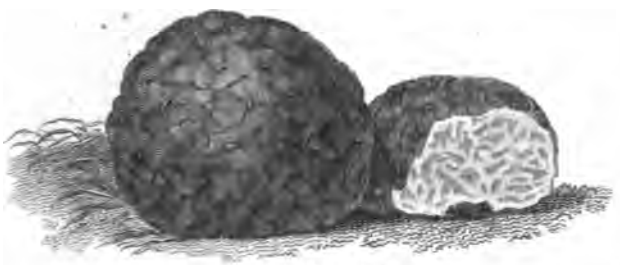
MERULIUS eburneus.



AURICULARIA reflexa.



NIDULARIA campanulata.



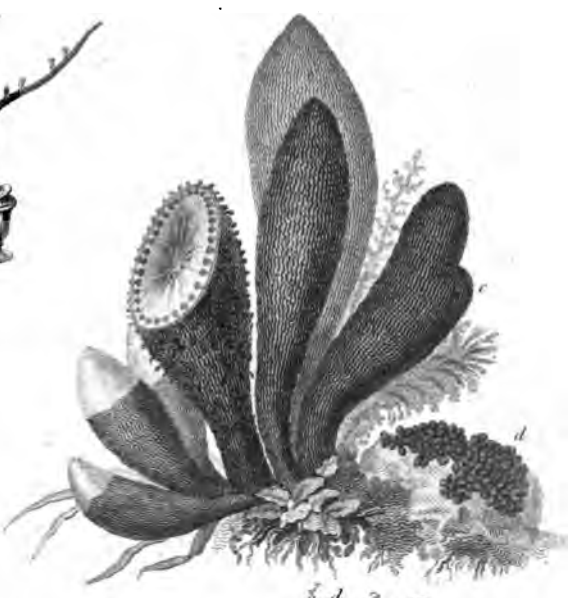
TUBER cibarium.



CYATHUS minutus.



a.TRICHIA denudata.
b. *nuda.*



c. SPHÆRIA digitata.
d. *bombardica.*



UREDO segetum.



ÆCIDIUM anemones.



PHIZOMORPHIA phosphorea.

QUADRUPEDS

CLASS MAMMALIA. GENUS MOSCHUS MUSK. GENUS CERVUS DEER.



1. Moschus Moschiferus. Thibet Musk. 2. Mospygmæus. Guinea M. 3. M. Javanicus. Java M. 4. Cervus Alces. Elk.

PLATE CXXX.—QUADRUPEDS.

Class Mammalia. Genus Moschus—Musk. Genus Cervus—Deer.

Fig. 1. *Thibet Musk. Moschus Moschiferus*, Linn.

Generic character. The incisory teeth are $\frac{0}{8}$; the canine teeth $\frac{1}{1}$; the grinders are $\frac{6}{6}$; total 34; the canine teeth are wanting in the females; in the males, the canines are large; the ears are long and pointed; the body is slender; the feet cleft, with hoofs; the tail is very short; and with two inguinal teats.

The Thibetian Musk is destitute of horns; the upper jaw is considerably longer than the lower one, and is furnished with a curved tusk of about two inches in length, exposed to view when the mouth is closed. These tusks are of a different form from those of any other animal, being edged on their inner or lower side, so as somewhat to resemble a pair of small crooked knives; the ears are long and narrow, of a pale yellow in the inside, and deep brown on the outside; the chin is yellowish; the general colour of the body is of a deep iron gray; the tips of the hairs being ferruginous, and the remainder blackish, growing much paler towards the roots. The general appearance of this animal resembles the roe-buck; it measures about three feet three inches from the top of the haunches to the bottom of the hind feet.

This animal is hunted on account of the well-known perfume called musk, which is secreted in an oval receptacle, about the size of a small egg, hanging from the middle of the abdomen, and peculiar to the male. This little bag is found constantly filled with a soft, unctuous, brownish substance, of a most powerful and penetrating smell. As soon as the animal is killed, the hunters cut off the musk bag, and tie it up ready for sale; the quantity in each bag is about two drachms.

The species must be very abundant in its native country, for Tavernier tells us, that in one journey he collected the astonishing number of seven thousand six hundred and seventy-three musk bags.

In Russia, the skins of these animals are used for clothing.

Fig. 2. *Guinea Musk. Moschus Pygmæus*, Linn.

The Pigmy or Guinea Musk is the smallest of all ruminating animals; most elegantly formed, and measuring little more than nine inches from the nose to the tail. Its colour is bright bay, white beneath, and on the inside of the thighs. Its legs do not exceed the diameter of a swan quill. It is a native of many parts of the East Indies and the Indian islands, and is said to be common in Java, where the natives catch great numbers of them in snares, and carry them to the markets in cages for sale. Mr. Pennant says they may be purchased at so low a rate as two-pence half-penny apiece.

Fig. 3. *Java Musk. Moschus Javanicus*, Linn.

This is another small animal of the ruminating kind, being only about seventeen inches in length, and not weighing more than five pounds. It is readily distinguished by its colour, which is ashy olive; the throat, breast, and belly are white, and the sides and haunches spotted and barred transversely with white; the ears are large and open; and the tail very short. It is a native of the Indian islands, and is chiefly found in Ceylon and Java.

Genus Cervus.—Deer.

Generic characters. The head, which is elongated, is not very large, and most generally terminates by a smooth membranous surface which is called the muzzle; the nostrils are acutely oval and laterally situated; the eyes large and well proportioned, having the pupils transversely extended. At a short distance below the inner angle of the eye, a peculiar pouch or cavity is found in most of the species, which secretes an unctuous humour in small quantities; these cavities are called *larmiers* by the French naturalist. The ears are large and pointed; the neck is of moderate length, the body plump, and the limbs slender, though strongly knit. The teats are inguinal, and four in number: the gall-bladder does not exist in these animals. The tail is short.

The hair is very similar in colour throughout the species of this genus, and is dry and harsh; the young deer or fawns are mostly spotted with white upon a brownish yellow ground.

The males of this genus are all provided with horns, which are variously branched, or palmated, and are annually caducous. These horns are remarkable for being composed of *bone*, which is solid, throughout, and in its first or growing state is covered by a velvet-like membrane, through which blood circulates with great freedom. The horn commences its growth from a basis or peduncle which is attached to the frontal bone, having something of the form of a truncated cone; a short distance above this, on the level of the outer surface of the skin of the head, the horn is expanded in the form of an irregular tuberculous ring, which is called the *burr*,* above which the solid part of the horn rises to form the various branches or palmations, according to the species. The blood-vessels going to the horn are very large at the commencement and during its growth, and the extension of the velvet-like membrane is as rapid as the advance of the bone or horn. As soon as the horn attains its full growth, the blood-vessels contract and diminish until they cease to convey blood to the velvet membrane, which then dries, loses its sensibility, and gradually flakes off. After the rutting season, a slight tumescence occurs at the edge of the peduncle, and the whole horn is at length detached and falls off.

Dental System.

32 Teeth:

- 12 Upper
 - 0 Incisive
 - 0 Canine
 - 12 Molars.
 - 6 False
 - 6 True Molars.
- 20 Lower
 - 8 Incisive
 - 0 Canine
 - 12 Molars.
 - 6 False
 - 6 True Molars.

In the upper jaw the three first molars are bordered by a thick crest at their internal edges; the two following are formed of two parts, each of which is composed of a single tubercle, having two crests in front, one on the outside, terminating abruptly, the other on the inside, which descends as far as the middle of the height of the tooth, and then rises upwards to rejoin the anterior border of the principal tubercle; between this crest and the tubercle there is a hollow. When the tubercle begins to wear, it exhibits a portion of a narrow circle, bordered by enamel. The last molar differs from the two preceding solely in being somewhat narrower, and in having thinner crescents.

In the lower jaw the first incisor is the largest, the second and third are somewhat less than the other, and the last is very small. They are all trenchant, inclined forwards, and separate themselves slightly from the median line. The two first false molars are simple, the third has a spur at its posterior part, and the three last differ very slightly from each other.

In their reciprocal position the inferior incisors correspond to the superior maxillary bone; the molars are alternate.

The writings of naturalists exhibit great confusion relative to the North American species of deer. Much of this evil is attributable to the loose manner in which species have been proposed upon the authority of persons unqualified to distinguish between accidental varieties, dependent upon sex or age, and those permanent characteristics indicative of specific constitution.

Cuvier, with his usual acumen and amplitude of research, has turned his attention to this subject, with great advantage to

* The part commonly used for cane-heads, &c.

students of natural history. Though he may not have been the first or only naturalist who knew and discriminated correctly the North American species, he is the first who has displayed his researches in such a manner as will enable every one to satisfy himself of the accuracy of his deductions. He has admitted the following to be the species now inhabiting this country, all the others named as distinct in the books being mere varieties: *C. Alces*, the Moose; *C. Canadensis*, the American Elk; *C. Tarandus*, the Rein Deer; *C. Virginianus*, the Common Deer.

To this list must be added the *C. Macrotis*, Mule or Black-tail Deer, first indicated by Lewis and Clarke, and described by Say, under the name just given, in Long's Expedition to the Rocky Mountains.

FIG. 4. *Elk of Europe.—Moose of America. Cervus Alces*, LINN.

The Moose is perhaps the only deer whose general appearance can be called ungraceful, or whose proportions at first sight impress the beholder unfavourably. Its large head terminates in a square muzzle, having the nostrils curiously slouched over the sides of the mouth; the neck, from which rises a short thick mane, is not longer than the head, which in males is rendered still more cumbrous and unwieldy, by wide palmated horns: under the throat is found an excrescence from which grows a tuft of long hair; the body, which is short and thick, is mounted upon tall legs, and the whole aspect is so unusual that incidental observers are pardonable for considering it ugly. Yet as these singularities of structure have direct or indirect reference to peculiarities of use, an inquiry into the mode of life led by this species, may cause us to forget, in admiration of its adaptation to circumstances, prejudices excited by the comparative inelegance of its form.

The moose inhabits the northern parts of both continents; on the American it has been found as far north as the country has been fully explored; its southern range, at former periods, extended to the shores of the great lakes and throughout the New England States. At present it is not heard of south of the state of Maine, where it is becoming rare. In Nova Scotia, the isle of Breton, the country adjacent to the bay of Fundy, and throughout the Hudson's Bay possessions, the moose is found in considerable numbers.

The dense forests and closely shaded swamps of these regions are the favourite resorts of this animal, as there the most abundant supply of food is to be obtained with the least inconvenience. The length of limb and shortness of neck, which in an open pasture appear so disadvantageous, are here of essential importance, in enabling the moose to crop the buds and young twigs of the birch, maple, or poplar; or should he prefer the aquatic plants, which grow most luxuriantly where the soil is unfit to support other animals, the same length of limb enables him to feed with security and ease. We cannot avoid believing that the peculiar lateral and slouching position of the nostrils is immediately connected with the manner in which the moose browses. Their construction is very muscular, and seems well adapted for seizing and tearing off the twigs and foliage of trees, and conveying them to the mouth; it may also be designed to prevent the sense of smell from being at any time suspended by the prehension of food. The probability of this last suggestion is strengthened by the fact that the moose is endowed with an exquisite sensibility of smell, and can discover the approach of hunters at very great distances. When obliged to feed on level ground, the animal must either kneel or separate the legs very widely; in feeding on the sides of acelivities, the moose does so with less inconvenience by grazing from below upwards; the steeper the ground may be, so much the easier is it for this species to pasture. Yet, whenever food is to be procured from trees and shrubs, it is preferred to that which is only to be obtained by grazing.

The moose, like his kindred species, is a harmless and peaceful animal, except in the season when the sexes seek each other. Then the males display a fierceness and pugnacity which forms a strong contrast to their ordinary actions; were they examined only during such seasons, the character of the species would be entirely misconceived. Under the influence of this powerful, though temporary excitement, the males battle furiously with each other, and resist the aggressions of man himself with vigour and effect.

In the summer the moose frequents swampy or low grounds near the margins of lakes and rivers, through which they delight to swim, as it frees them for the time from the annoyance of insects. They are also seen wading out from the shores, for the purpose of feeding on the aquatic plants which rise to the surface of the water. At this season they regularly frequent the same place in order to drink, of which circumstance the Indian hunter takes advantage to lie in ambush, and secure the destruction of the deer. At such drinking places, as many as eight or ten pairs of moose horns have been picked up.

During the winter the moose, in families of fifteen or twenty, seek the depths of the forest for shelter and food. Such a herd will range throughout an extent of about five hundred acres, subsisting upon the mosses attached to the trees, or browsing the tender branches of saplings, especially of the tree called moose-wood. The Indians name parts of the forest thus occupied, moose-yards.

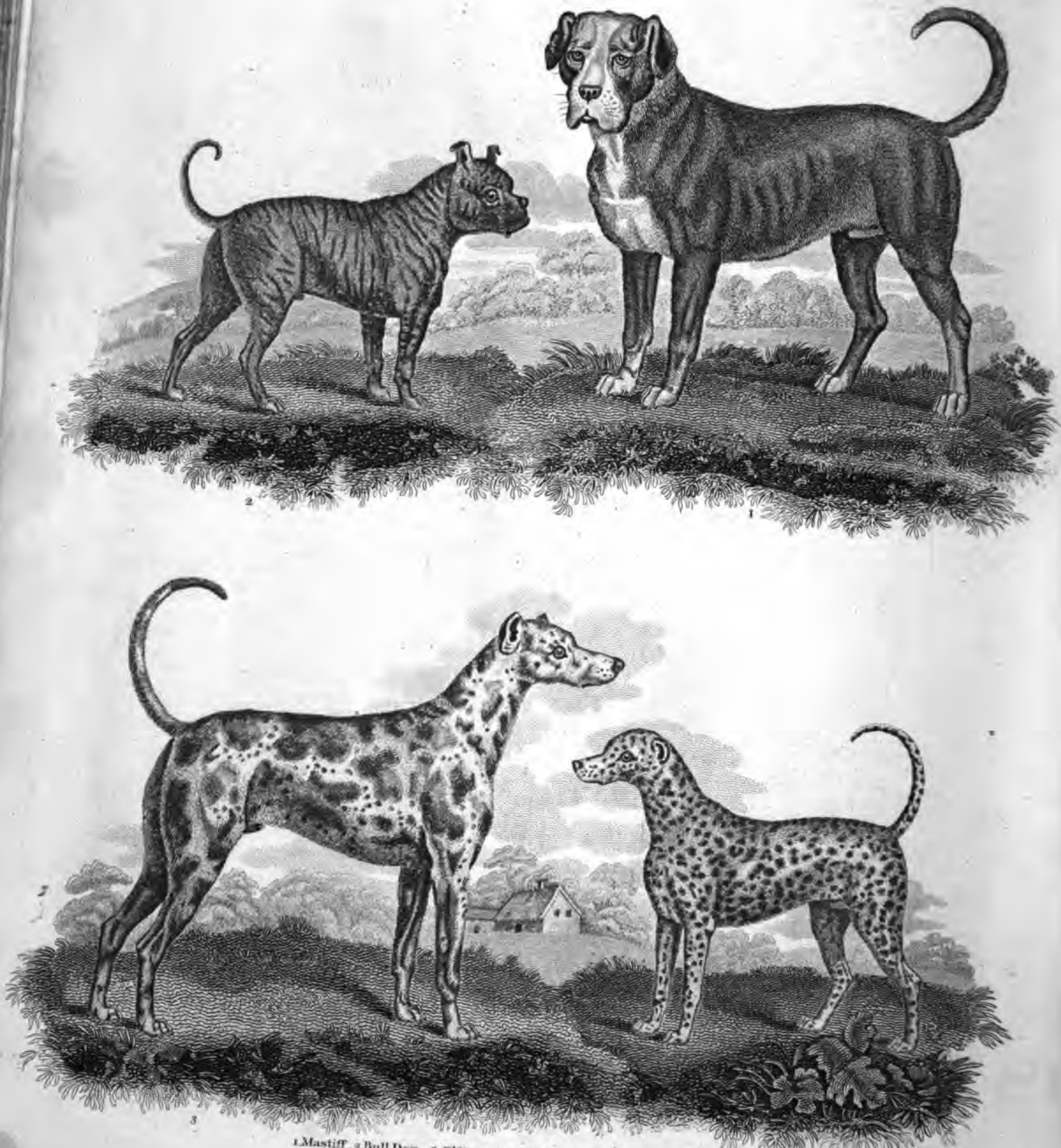
In Nova-Scotia, New-Brunswick, and the island of Grandmanan, the moose is generally hunted in the month of March, when the snow is deep, and sufficiently crusted with ice to bear the weight of a dog, not that of a moose, as has been stated. Five or six men, provided with knapsacks, containing food for as many days, and all necessary implements for building their "camp" at night, set out in search of a moose-yard. When they have discovered one, they collect their dogs and encamp for the night, in order to be ready to commence the chase at an early hour, before the sun softens the crust upon the snow, which would be the means of retarding the dogs, and facilitating the escape of the deer. At daybreak the dogs are laid on, and the hunters, wearing large snow-shoes, follow as closely as possible. As soon as the dogs approach a moose, they assail him on all sides, and force him to attempt his escape by flight. The deer, however, does not run far, before the crust on the snow, through which he breaks at every step, cuts his legs so severely, that the poor animal stands at bay and endeavours to defend himself against the dogs by striking at them with his fore feet. The arrival of the hunter within a convenient distance, soon terminates the combat, as a ball from his rifle rarely fails to bring the moose down.

Judging by the rapid diminution of this species within a comparatively few years, it is to be feared that it will, at no great distance of time, be exterminated. The moose is easily tamed, although of a wild and timid disposition; sometimes when taken very young, they are domesticated to a remarkable degree. We are informed by our friend Mr. Vanbuskirk, of New-Brunswick, that he knew of one which was taken, when two days old, by an Indian, and presented to a gentleman in Nova-Scotia. The proprietor allowed it to suck a cow for three months, and afterwards fed it with different vegetables, until it was a year old. This moose displayed a singular animosity against one of the young ladies of the family, and would chase her with fierceness into the house. When the door was closed in time to exclude him, he would immediately turn round and kick violently against it.

The horns of the moose spread out almost immediately from their base into a broad palmation: in old animals they increase to a great size, and have been known to weigh fifty-six pounds, each horn being thirty-two inches long. The horns are generally cast in the month of November; the Indians employ them for various purposes, cutting them into spoons, scoops, &c.

QUADRUPEDS.

CLASS I^ma MAMMALIA – *ORDER III^tia* FERÆ – *GENUS XV^ta* CANIS.



1.Mastiff – 2.Bull Dog – 3.G^t Danish or Harlequin D. 4 Dalmatian Dog.

Murray &c.

When chased, the moose throws his horns towards his neck, elevates his nose, and dashes swiftly into the thickest of the forest; occasionally the horns prove the means of his destruction, by being entangled among vines, or caught between small trees. Where the moose runs over a plain, he moves with great celerity, although his gait is nothing better than a sort of long shambling trot: this, however, is rendered very efficient, by the great length of his limbs. While running in this manner, the divisions of the hoofs, which are very long, separate as they press the ground, and close together as they are raised, with a clattering sound, which may be heard to some distance: this circumstance is also remarked in the rein-deer.

Notwithstanding the ease and swiftness of their movements, they would be easily captured, if pursued by horsemen and hounds, in a country adapted to such a chase, as they are both short-breathed and tender-footed.

The acuteness of their sense of hearing, thought to be that which is possessed by the moose in the greatest degree of perfection, together with the keenness of their smell, renders it very difficult to approach them. The Indians attempt it by creeping among the trees and bushes, always keeping to leeward of the deer. In summer, when they resort to the borders of lakes and rivers, the Indians often kill them while crossing the streams, or when swimming from the shore to the islands. "They are," says Hearne, "when pursued in this manner, the most inoffensive of all animals, never making any resistance; and the young ones are so simple, that I remember to have seen an Indian paddle his canoe up to one of them and take it by the poll, without the least opposition: the poor harmless animal seeming, at the same time, as contented alongside the canoe as if swimming by the side of its dam, and looking up in our faces with the same fearless innocence that a house lamb would, making use of its fore foot almost every instant to clear its eyes of musquitoes, which at that time were remarkably numerous."

The flesh of the moose, though generally coarser and tougher than other venison, is esteemed excellent food, and the Indians, hunters and travellers, all declare they can withstand more fatigue while fed on this meat than when using any other. The large and gristly extremity of the nose is accounted an epicurean treat, and the tongue of the animal is also highly praised, notwithstanding it is not commonly so fat and delicate as the tongue of the common deer. As the moose feeds upon the twigs, buds and small branches of the willow, birch, poplar, mosses, aquatic plants, &c. its flesh must be peculiarly flavoured. "The fat of the intestines is hard, like suet, but all the external fat is soft, like that of a breast of mutton, and when put into a bladder is as fine as marrow. In this they differ from all the other species of deer, of which the external fat is as hard as that of the kidneys." The female moose never has any horns; they bring forth their young, "from one to three in number, in the latter end of April or beginning of May."

The male moose often exceeds the largest horse in size and bulk; the females are much less than the males, and differently coloured. The hair of the male is long and soft, like that of a common deer; it is black at tip, but within it is of an ash colour, and at the base pure white. The hair of the female is of a sandy brown colour, and in some places, especially under the throat, belly and flank, is nearly white at tip, and altogether so at base.

The skin of the moose is of great value to the Indians, as it is used for tent-covers, clothing, &c.

The moose, like other deer inhabiting the northern regions, is exceedingly annoyed by insects, which not only feast upon its blood, but deposit their eggs in different parts of its body, along the spine, within the cavities of the nose, mouth, &c. These eggs, when hatched, form large larvæ or maggots, that feed on the parts within which they are placed, until ready to assume their perfect or winged condition, when they perforate the skin and take flight. So great a number of such perforations are made at certain seasons, that the skins of the moose are rendered worthless to the hunter, unless it be for the purpose of cutting them into thongs for nets and other uses.

See Godman's Nat. Hist. ii. 274.

PLATE CXXXI.—QUADRUPEDS.

Genus Canis.*

Fig. 1. *Mastiff. Canis Anglicus*, Linn.

This is a large and powerful animal, much stronger than the bull-dog; his ears are longer and more pendulous; his lips are full and loose, the upper one hanging considerably over the lower at the two extremities; his aspect is grave, and somewhat sullen; and his bark loud, deep-toned, and terrific, particularly during the night.

The mastiff differs in form from the bull-dog, in being much longer in the legs, and not so deep in the chest; and while his head is large in proportion to his body, he wants the projecting under-jaw of the latter.

This dog, from his large size and commanding aspect, is naturally calculated to intimidate strangers; and he is admirably suited for, and principally used in protecting large and extensive premises containing property of value, which he watches with most scrupulous care and assiduity. He is so instinctively impressed with the importance of his charge, that he will only quit it with the loss of his life, which he will rather forfeit than betray the confidence reposed in him. With his naturally commanding and imposing appearance, calculated to keep at a distance the ill-intentioned, he is nevertheless possessed of the greatest mildness of manners, and is as solicitous to gain attention, and as faithfully grateful for favours bestowed, as the most diminutive of the canine tribe. The mastiff displays one peculiarity which seems inherent,—his ferocity is always increased by the degree of restraint in which he is kept. If constantly on the chain, he is much more dangerous to approach than when in a state of liberty; from whence it evidently appears, that what may be considered a friendly kindness on one side, is always productive of confidence on the other.

The mastiff usually shows a remarkable and peculiar warmth in his attachments, and, on the other hand, he is equally distinguished for inveteracy in his dislike. If he is once severely corrected or insulted, it is almost impossible to eradicate the feeling from his memory, and it is no less difficult to obtain a reconciliation with him. He seems conscious of his own strength, power, and authority, and will seldom condescend to lower his dignity by servile fawning; while he appears to consider his services as only befitting a trust of the highest importance. This dog is naturally possessed of strong instinctive sensibility, speedily obtains a knowledge of all the duties required of him, and discharges them, too, with the most punctual assiduity. In the protection of gardens, houses, wood yards, and widely-extended manufactories, his vigilance is very striking: he makes regular rounds of the whole premises, like a watchman, examines every part of them with a careful eye: his penetration reaches even the remotest corner, and not a spot is passed by, until he is satisfied that all is in a state of perfect security. During the night he gives a signal of his presence by repeated and vociferous barkings, which are increased upon the least cause of alarm; and, contrary to the spirit of the bull-dog, whose invariable practice is to bite before he barks, the mastiff always warns before he attacks.

This breed is very difficult to be obtained in purity, from the various admixtures and experimental crosses which have taken place. The genuine old English mastiff is now rarely to be seen, although there are dogs of various sizes and colours which go under that name.

* For the characteristics of this genus, see Vol. I.

Notwithstanding frequent proofs of extensive depredations upon the timid and unresisting part of the animal creation, instances are but rare of his making a determined attack upon the human species, without the most palpable provocation. In opposition, however, to the received opinion of the almost unimpeachable fidelity and implicit obedience of this animal, and in verification of the ancient remark, that "there is no rule without an exception," we shall introduce the recital of a circumstance which occurred in 1803, at Mitcham, in Surrey.

Indiscriminate Resentment.—A butcher of that place having reared a true-bred mastiff from a puppy, became much attached to him, and the latter was so fond of his master, that it invariably followed him as a spaniel, whenever he went from home.

During this scene of mutual confidence, the master had purchased some horse-flesh for the dog, of which he had given him a part; but, not completely satisfied with what had been allotted to him, the animal, by some means, possessed himself of that which was reserved. In the master's endeavour to take away the food, the dog seized his arm with the most incredible ferocity, and tore away the flesh in a dreadful manner; after which he made a sudden transition to his throat, where he fastened himself with the utmost obstinacy, and from which he was not disengaged till he was nearly strangled by a rope fixed round his neck by the neighbours, for that purpose. Upon feeling the painful pressure of the cord upon his neck, he was compelled to relinquish his gripe; but so enthusiastic and extraordinary was the attachment of the master to his most unworthy favourite, that, although his life was for some time in imminent danger, he would never give his consent that the dog should be destroyed. The resentment of the dog was considered the more extraordinary, as the animal had been always remarkable for his docility and peaceable disposition. Whether any sudden effect arising from the horse-flesh, (to which he had been unaccustomed,) or an instantaneous impulse of passion at being deprived of so luxurious a repast, was the occasion of this temporary fury, could never be ascertained, though certain it is the dog quietly returned to his previous calmness, obedience, and domestic fidelity.

Fig. 2. *Bull-Dog. Canis Molossus*, Linn.

The Bull-dog is low in stature, deep-chested, and strongly made about the shoulders and thighs; the muscles of both of which are extremely developed. His head is broad, his nose short, and the under-jaw projects beyond the upper, which gives him a fierce and disagreeable aspect. His eyes are distant and prominent, and have a peculiar suspicious-like leer, which, with the distension of his nostrils, gives him also a contemptuous look; and from his teeth being always seen, he has the constant appearance of grinning while he is perfectly placid. He is the most ferocious and unrelenting of the canine tribe, and may be considered courageous beyond every other creature in the world; for he will attack any animal, whatever be his magnitude.

The internal changes which determine the external characters of this dog, consist in a great development of the frontal sinuses,—a development which elevates the bones of the forehead above the nose, and draws the cerebral cavity in the same direction.

But the most important quality, and that, perhaps, which causes all the others, although we cannot perceive the connexion, is the diminution of the brain. The cerebral capacity of the bull-dog is sensibly smaller than any other race; and it is doubtless to the decrease of the encephalon that we must attribute its inferiority to all others in everything relating to intelligence. The bull-dog is scarcely capable of any education, and is fitted for nothing but combat and ferocity.

This animal takes his name from his having been employed in former times in assaulting the bull, and he is used for the same purpose at the present day, in those districts where this brutal amusement is still practised.

Nothing can exceed the fury with which the bull-dog falls upon all other animals, and the invincible obstinacy with which he maintains his hold. In attacking the bull, he always assails him in front, and generally fastens upon his lip, tongue, or eye, where he holds and hangs on, in spite of the most desperate efforts of the other to free himself from his antagonist, which affords ample proof of the amazing strength and power of this animal.

Whenever a bull-dog attacks in any of the extremities of the body, it is invariably considered a mark of his degeneracy from the original purity of blood. Puppies will assail a bull, and thereby give a decided proof of their breed, when only six months old; and, if permitted, will rather suffer themselves to be destroyed than relinquish the contest.

Although this trial is sometimes made with the whelps of a particular litter, to demonstrate the purity of their descent, and to prove that there has been no improper cross by which the future fame of their posterity may be affected, yet they are seldom entered in a regular ring until from fifteen to eighteen months old. But their ligaments cannot be considered as at their full strength until they are at least two years old. Indeed, amateurs say that they are not at their prime until they have attained four or five years of age.

The bull-dog is admitted by naturalists to be one of the original and peculiar races of Britain, and may be ranked, in point of originality, with the shepherd's dog and Irish greyhound. In various districts of England, this breed is still preserved in its native purity, by that class of people who delight in bull-baiting, and fighting of dogs; both of which amusements, alike inhuman, are now happily on the decline.

But bull-dogs are not so numerous as they were, nor so carefully attended to, in consequence of the decline of what was anciently a favourite sport. At a former period, great numbers were purchased and transported to other countries, from England, for which enormous prices were sometimes given.

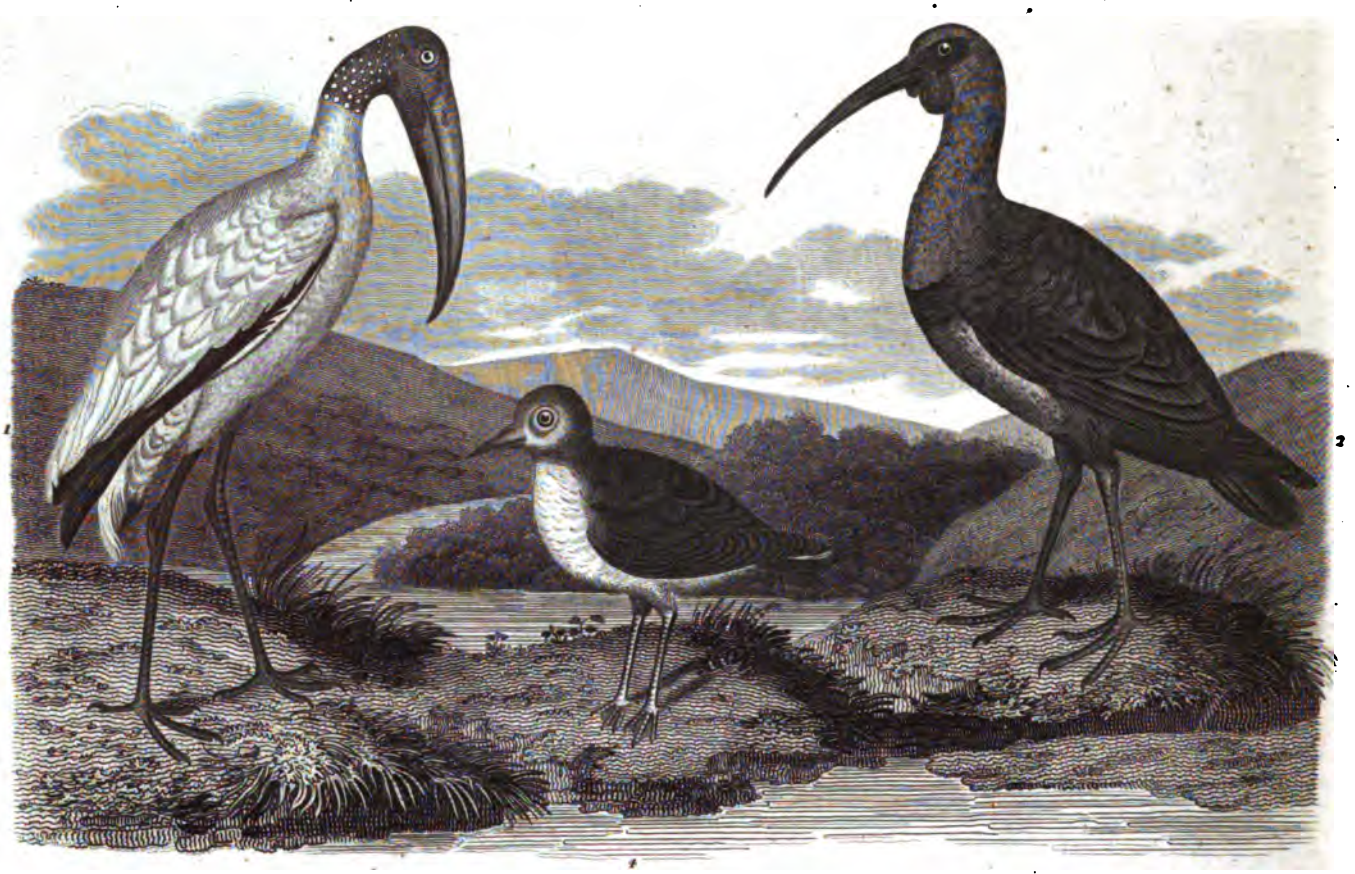
Fig. 3. *Great Danish, or Harlequin Dog. Canis Maculatus.*

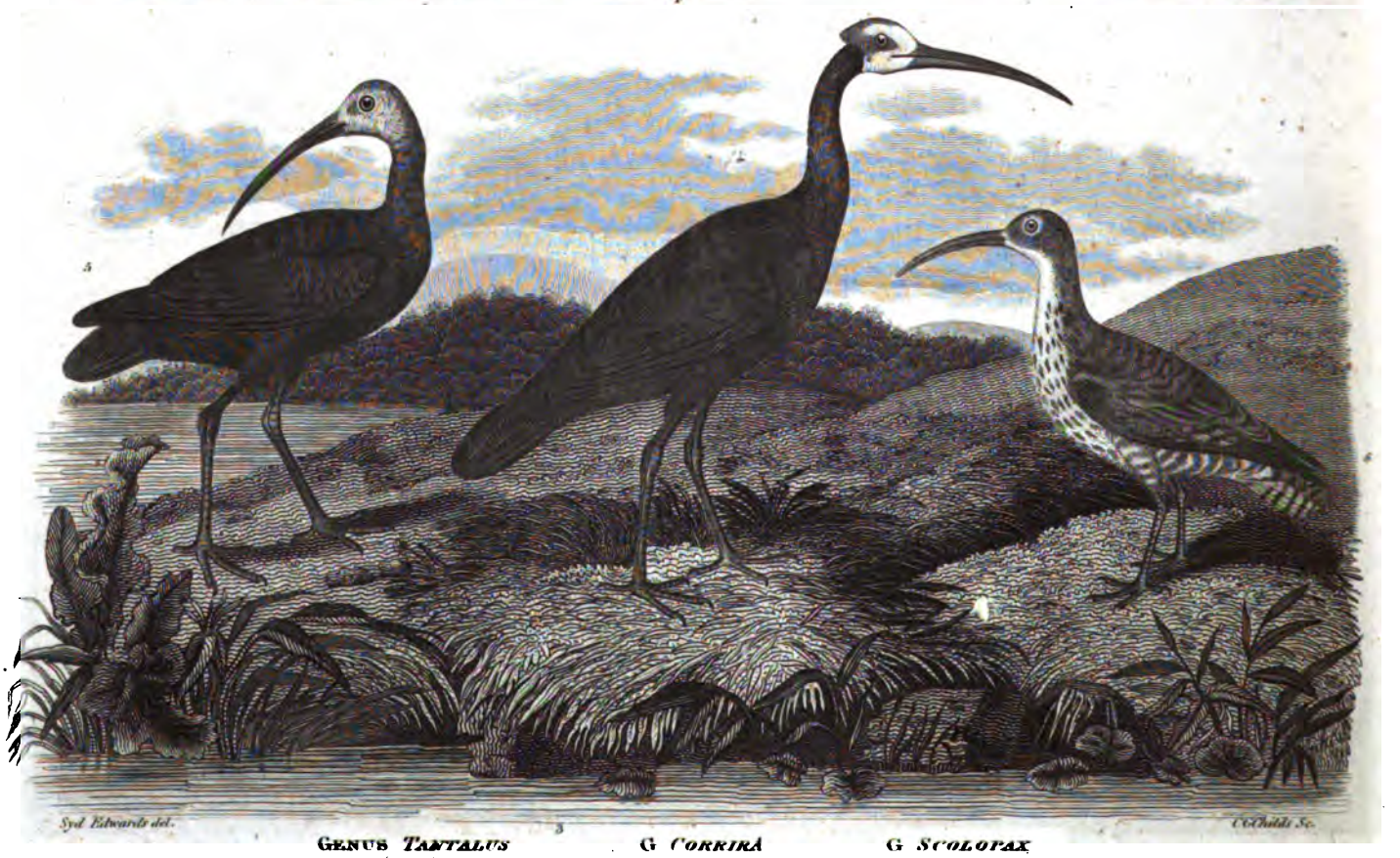
Buffon was of opinion that this variety is only the French mâtin transported into a northern latitude. The colour of this dog is generally white, marked all over his body with numerous black spots and patches, in general larger than those of the Dalmatian. His ears are for the most part white, while those of the Dalmatian are usually black.

The Great Danish dog is a fine sprightly animal, but is of little use either for sporting or watching. He is chiefly used as an attendant on carriages, to which he forms an elegant appendage.

Discovers an Assassin.—Mr. Johnson, a traveller from Manchester, on his route through Scotland, on horseback, was benighted, and coming to a small public-house on the road, he thought it better to take up his lodgings there, if possible, than to proceed farther that night. On entering the house, he found only an old woman, who, to his inquiries, answered she would accommodate him with a bed, and provide for the horse in a small shed, if he would assist her in carrying hay and litter, as there was no other person then in the house. This was readily agreed to by Mr. Johnson, who, after having done so, and taken a little refreshment, was shown by the old woman to his bed-room.

A large Danish dog, which accompanied him on his journey, offered to go up to the room with him, which the old woman strongly objected to, but Mr. Johnson firmly persisted in having him admitted. The dog, on entering the room, began to growl, and was altogether very unruly. His master in vain attempted to quiet him,—he kept growling and looking angrily under the bed, which induced Mr. Johnson to look there like-





Syd. Edwards del. C.Childs Sc.

GENUS *TANTALUS* (Ibis) — G *CORRIRA* (Courier) — G *SCOLOPAX* (Whimbrel)

1.T.*Loculator* WOOD I. — 2.T.*Melanopis* BLACK FACED I. — 3.T.*Calvus* BALD I. — 4.C.*Italica* ITALIAN C. — 5.S.*Leucocephala* WHITE HEADED CURLEW. — 6.S.*Phæopus* WHIMBREL.

wise, when, to his utter astonishment, he saw a man concealed at the farther end. On encouraging the dog, he sprang immediately at him, whilst Mr. Johnson seized his pistols, and, presenting one at the stranger, who had a large knife in his hand, and was struggling with the dog, swore he would instantly shoot him if he made further resistance. The man then submitted to be bound, and acknowledged that his intention was to rob and murder Mr. Johnson, which was thus providentially prevented by the wonderful sagacity of his faithful dog. Mr. Johnson, after properly binding the individual, and securing the door, went (accompanied by his dog,) to the shed where his horse was left, which he instantly mounted, and escaped without injury to the next town, where he gave to a magistrate a full account of the horrid attempt, who had the culprit taken into custody, and afterwards executed for his villany.

FIG. 4. *Dalmatian Dog. Canis Dalmatianus*, LINN.

This dog has been erroneously called the Danish Dog, by some authors, and Buffon and some other naturalists imagine him to be the Harrier of Bengal; but his native country is Dalmatia, a mountainous district of European Turkey. He has been domesticated in Italy for upwards of two centuries, and is the common Harrier of that country.

The Dalmatian is also used as a pointer, to which his natural propensity more inclines him than to be a dog of the chase: he is said to be easily broken, and to be very staunch. He is handsome in shape, something betwixt the British fox-hound and English pointer; his head is more acute than that of the latter, and his ears fully longer: his general colour is white, and his whole body and legs are covered with small irregular-sized black or reddish-brown spots. The pure breed has tanned cheeks and black ears. He is much smaller than the large Danish dog. A singular opinion prevailed at one time, in England, that this beautiful dog was rendered more handsome by having his ears cropped: this barbarous fancy is now quickly dying away.

PLATE CXXXII.—ORNITHOLOGY.

Genus TANTALUS. Genus CORRIRA. Genus SCOLOPAX.

The Tantali in many respects resemble the Storks, particularly in the feet, nostrils, and beak; but the latter is more rounded above, and its point is recurved towards the base, and slightly notched on each side. Part of the head and neck is generally divested of feathers: the legs are very long, and a considerable portion of the thighs is naked.

These are solitary birds, and, like the Herons, they delight in marshy places, where they may be observed standing, for a long time, upon one leg, with their necks bent back, and their beaks resting on their breasts: their chief food consists of reptiles and small fishes.

FIG. 1. *Wood Ibis. Tantalus loculator*, LINN. *Tantalus leucocephalus*, CUV.

The white-headed, or Ceylonese tantalus, is the largest of the genus, and is also the most remarkable for the great size of its beak, that alone measuring upwards of a foot in length: the prevailing colour of the plumage is grayish white: the wing-coverts are black, edged with white: the quills and tail are black: the rump and tail-coverts are pink: the beak, fore part of the head and cheeks are yellow: the legs are pale flesh-colour: the tail is concealed by its coverts, which are very long. The other sex is said to differ in having a brown bar across the breast, and the wing-coverts being shaded with brown.

This species inhabits India and the island of Ceylon. The pink feathers of the rump, which are used as ornaments, are said to lose their colour during the rainy season.

FIG. 2. *Black-faced Ibis. Tantalus melanopis*, LINN. *Ibis melanopis*, CUV.

The black-faced ibis is figured and thus described by Dr. Latham, in his Synopsis: "Size large, not much inferior to the wood ibis; length twenty-eight inches, breadth forty-nine inches and a half: bill six inches, and black: tongue triangular, ciliated at the back part: irides reddish: the whole face, quite beyond the eyes, is bare of feathers, black and warty, particularly round the eyelids: under the chin hangs a loose, wrinkled, bare skin, forming a pouch: the crown of the head is deep fulvous yellow, and the feathers at the back part longish: the rest of the neck and breast pale yellow: the back and scapulars are cinereous, margined with brown: across the breast a band of the same: the middle of the feathers of the back brown: the wing-coverts bluish ash-colour, margined with brown: the quills, sides, thighs, vent, and tail, are greenish-black; the last consists of twelve feathers, and is rounded in shape: the legs are seven inches long, rough, naked but a little above the knee, and red: claws black. This species was found by Dr. Forster, on New Year's Island, near Staten Land, during the second voyage of Captain Cook: it builds its nest in inaccessible places in the rocks."

FIG. 3. *Bald Ibis. Tantalus calvus*, LINN. *Ibis calva*, CUV.

The bald ibis differs from the rest of this genus, in having the naked space on the head more extensive, inasmuch as it proceeds part of the way down the neck; the crown is red, and the rest white: the skin of the throat is naked and flaccid: the irides are brown: the general colour of the plumage is black, tinged with greenish, especially on the wing-coverts, the tips of which are glossed with copper: the beak is nearly six inches long, and, with the feet, is red: the female scarcely differs, except in having the crown of the head flatter. Inhabits the Cape of Good Hope and neighbourhood, near marshy places: and is easily tamed.

FIG. 4. *Italian Courier. Corrira Italica.*

Inhabits the borders of rivers and lakes, and is very abundant in the Grecian Archipelago. Its food consists of insects, worms, aquatic mollusca, and vegetables.

Genus SCOLOPAX, or WOODCOCK.

The Woodcocks have the upper mandible of the beak longer than the lower: their wings are acute, and the first quill-feather is longer than the rest: the claw of the hinder toe is rounded at its tip, and does not project beyond the toe itself. Another singular character relating to these birds, and also to those of the following genus, consists in the head being compressed, and having its eyes, which are very large, placed very backward therein; this gives them a very stupid appearance.

There are but two species known, which frequent woody places.

FIG. 5. *White-headed Curlew. Scolopax leucocephala*, LINN. *Ibis leucocephala*, CUV.

Described and figured by Latham, from the drawings of Sir Joseph Banks: "Size and shape of the common curlew: beak pretty long, and red: the head and part of the neck white: the rest of the plumage of a very deep blue, except the quills, which are black: legs cinereous gray:" inhabits the Cape of Good Hope. The bird called Hagedash or Hadelde, by Sparrman, is most probably the young of this species: its beak is five inches in length, above red, below and with the tip black: the neck and thighs are cinereous: the back is cinereous, variegated with green and yellow: the wings are obscure, above of a cerulean-black; the lesser wing-coverts are violet: the tail is wedge-shaped: the feet are dusky. It is larger than a hen; and is found at the Cape, resting by night on trees, and feeding on roots, especially bulbous ones.

Fig. 6. *Whimbrel.* *Scolopax phæopus*, Linn. *Numenius phæopus*, Cuv.

This bird is rather more than sixteen inches long: the whole of the plumage is of a bright ash, with longitudinal brown spots on the neck and on the breast: on the middle of the head is a longitudinal band of yellowish white, accompanied on each side with another, which is twice as broad, and brown: the belly and abdomen are white: the feathers on the back and the scapulars are of a very deep brown in the middle, and paler brown at their edges: the tail is of an ashy-brown, striped with oblique brown bands: the beak is dusky, tinged with reddish at its base: the irides are brown: the feet are lead-coloured. The young birds have the beak short, scarcely one inch and a half in length, and almost straight, whereas the old have it upwards of three inches in length, and considerably bent.

The whimbrel is a migrative bird, visiting the British coasts about August, and remaining there during the winter, keeping in small flocks of five or six: it feeds upon insects and worms; and is supposed to breed in the arctic regions: it occurs in various parts of Europe, Asia, and North America.

PLATE CXXXIII.—ORNITHOLOGY.

Genus Ampelis. Genus Colius.

Genus Ampelis, or Chatterer.

All the Chatterers but one, are natives of America: they feed on fruits and berries, but of their manners of life we are utterly ignorant, as they do not reside near the habitations of man, and no person has yet discovered their haunts, or the period of their incubation.

Fig. 1. *Carunculated Chatterer.* *Ampelis carunculata*, Linn. *Procinias carunculata*, Cuv.

Described by Dr. Latham as being twelve inches in length: the beak black; at its base a fleshy caruncle hanging over it, like that of a turkey-cock, being more or less dilatable, as far as two inches in length: the whole plumage of the male is of a pure white, except a slight tinge of yellow on the rump, quills, and tail: the legs are black: the female is furnished with the same caruncle as the male: the upper parts of her plumage are olive gray: her forehead and cheeks are white: throat gray, edged with olive: breast and upper part of the belly the same, tipped with yellow: lower part of the belly and vent pale yellow: the two middle tail-feathers like the back, the others gray, edged with yellow. The note of these birds, which is composed of the two syllables *in*, *au*, is uttered in a drawling kind of tone, but may be heard half a league off. They are common in Cayenne and Brazil.

Fig. 2. *Purple-breasted Chatterer.* *Ampelis cotinga*, Linn.

Length eight inches and three quarters: beak black: the head, all the upper parts of the body, and wing-coverts, of a splendid glossy blue: the greater coverts, wings, and tail, black: the throat and fore-part of the neck purple, varied with three or four irregular patches of bright scarlet: breast with a blue band, and in some individuals another of scarlet; rest of the under parts of the body blue: legs dusky: the female has all the upper parts of the body of a beautiful blue, and the throat, neck, and breast, purple: the belly and vent blue, in some places varied with black. Inhabits Brazil.

Fig. 3. *Pompadour Chatterer.* *Ampelis Pompadoura*, Linn.

The Pompadour chatterer is seven inches and a half in length: its beak is brown: the prevailing colour of its plumage is of a glossy purple; the feathers of the greater wing-coverts are narrow, long, and hollowed beneath, with their shafts white, and the tips bare of webs; they hang over the quills, which are white, except the tips of a few of the primaries, which are brown: the legs are black: this species varies in having a mixture of brown with the purple; the under tail-coverts rose-colour, and the tail brown: it has also occurred entirely of a gray brown.

Common in Cayenne and Guiana: it makes its appearance in the latter place in March and September: it feeds on fruits, and builds its nest in high trees, near the margins of a large river.

Fig. 4. *Red Chatterer.* *Ampelis carnifex*, Linn.

The note of this bird is very similar to the word *Ouette*, from whence it has received a corresponding name, by the natives of the parts it inhabits: it is in length seven inches: the male has the beak dull red: the head is crested, and, with the lower part of the back and belly, the rump, thighs, and vent, is of a bright crimson; the rest of the plumage is of a dull red, with the tips of the feathers dusky: the tail is crimson, with the tip black: the legs are dirty yellow: the female is entirely of a reddish brown, with the wings and tail tipped with black, as in the male.

This bird is very common in Cayenne, Guiana, and many other parts of South America.

Genus Colius.

Fig. 5. *Cape Coly.* *Colius capensis*, Linn.

Blue-gray, tinged with rufous: throat fulvous-white: the neck in front and breast green-blue: the body reddish. Inhabits Africa.

Fig. 6. *White-backed Coly.* *Colius erythropus*, Linn.

This species, which is figured and described by Dr. Latham, is said to have been sent from the Cape of Good Hope: it is in length twelve inches: beak white, the upper mandible tipped with black: head ornamented with a large crest, of a dusky brown colour: prevailing colour of the plumage above bluish ash; beneath, dirty white: lower part of the back, rump, and upper tail-coverts, purple, with a white fascia running down the middle: vent white: tail long, and cuneiform; the shafts chestnut: two outer feathers an inch and a half in length, and white on the exterior edge: legs red: claws dusky.

PLATE CXXXIV.—ICHTHYOLOGY.

Fig. 1. *Fistularia Chinensis*, Linn. *Aulostoma Chinensis*, Cuv. Chinese Tobacco-pipe Fish.

The general shape of this fish is not unlike that of an eel; but its head is singularly elongated and deformed. It subsists on smaller fishes, marine insects, or worms, &c., which the structure of its snout enables it to obtain, by introducing that part into the cavities of the rocks. Inhabits the China sea.

Fig. 2. *Fistularia tabacaria*, Linn. and Cuv. Spotted Tobacco-pipe Fish.

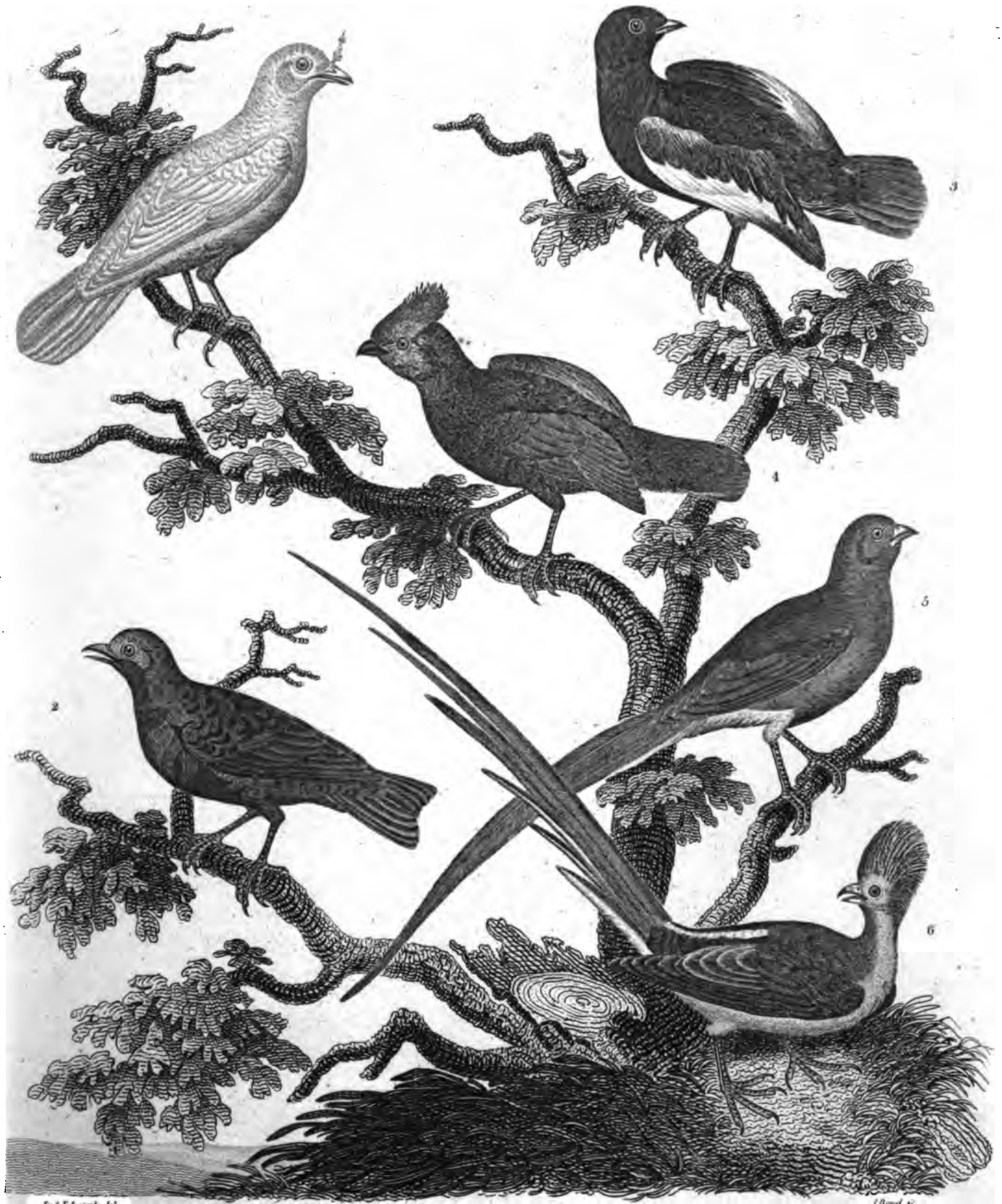
This very singular fish is also called the *Petimbauba*, and inhabits the seas of America and Japan. Like the former, it has much the shape of an eel. The tail ends in a singular filiform appendage, and the whole fish measures about a foot or a foot and a half.

Fig. 3. *Esox osseus*, Linn. *Lepisosteus osseus*, Cuv. Gar Fish, or Bony Pike.

This species is a native of North America, and has also been found in Europe. It attains a length of two or three feet, and is covered with rhombic scales.

Fig. 4. *Esox bellone*, Linn. *Belone vulgaris*, Cuv. Sea Pike.

Length from two to four feet, of a very slender form, and with a long projecting snout. It is a common species in the European seas, migrating annually, in large shoals, from the depths of the ocean to the shore. It is much eaten, but is a coarse fish.



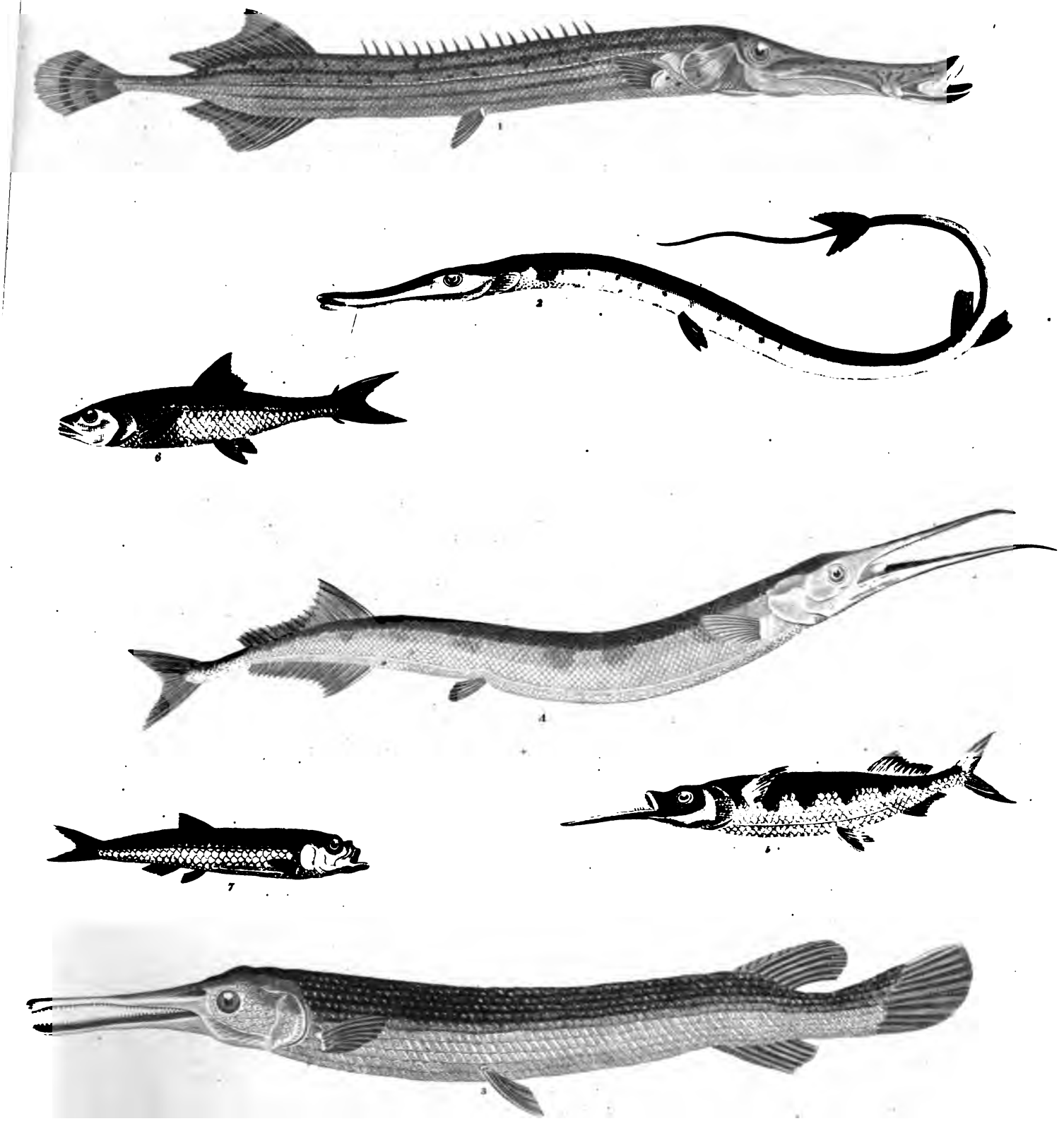
Sya. Edwards del. J. Basire sc.

GENUS *AMPELIS.*
(Chatterer)

1.A. *Carunculata* CARUNCULATED C.
2.A. *Cotinga* PURPLE BREASTED C.
3.A. *Pompadora* POMPADORE C.
4.A. *Manacus* RED C.

G. *COLIUS*
(Coly)

5.C. *Capensis* CAPE C.
6.C. *Erythropus* WHITE BACKED C.



FISTULARIA.
Tobacco Pipe Fish

1.F. *Chinensis* CHINESE TOBACCO P.F.

2.F. *Tabacaria* SPOTTED TOBACCO P.F.

GEN. ESOX.
(Sea Pike or Gar-Fish)

3.Es. *Osseus* Gr. GAR FISH or BONY P.

4.Es. *Belone* SEA PIKE or GAR F.

5.Es. *Brasiliensis* BRASILIAN P.

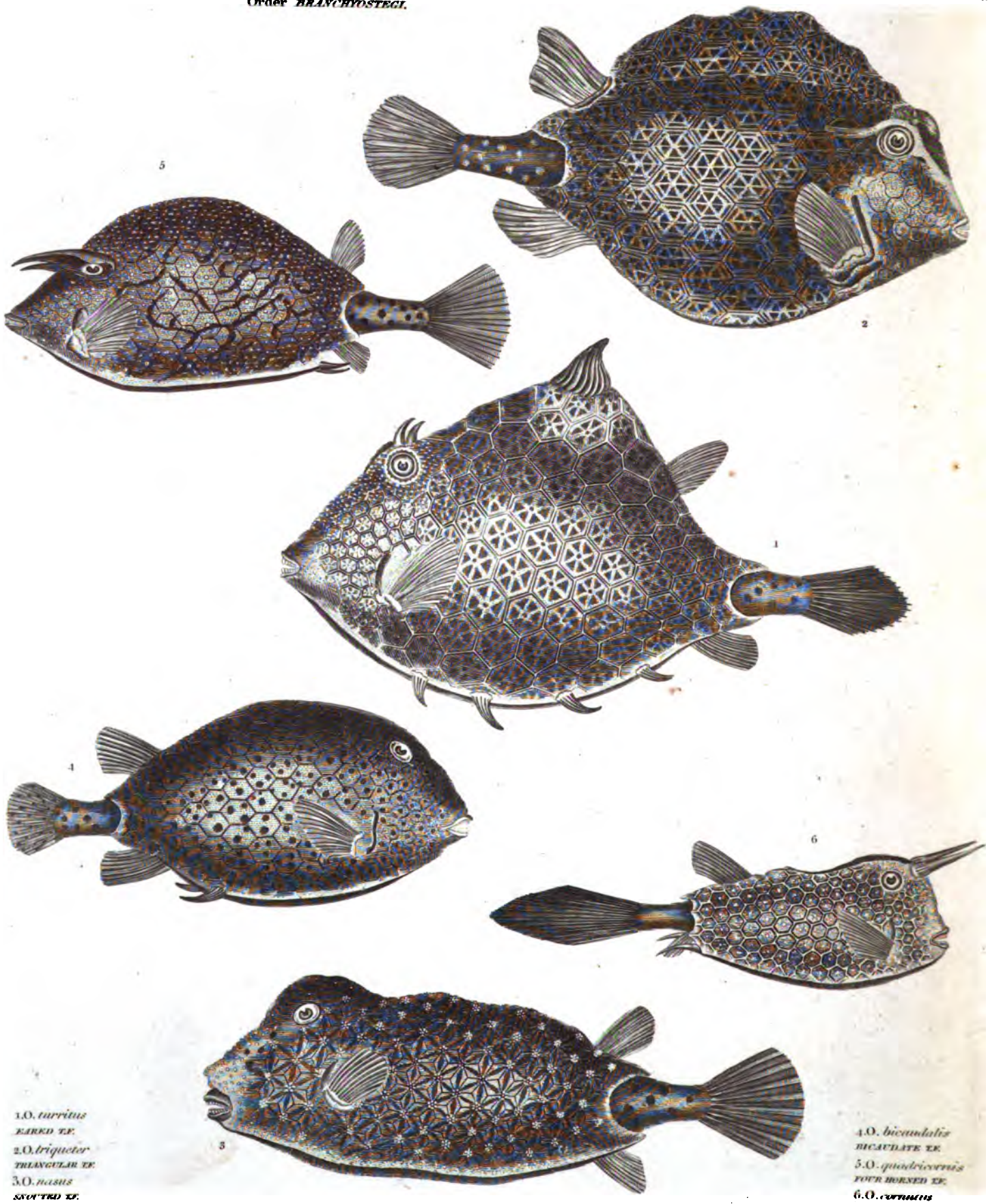
ELOPS.

6.El. *Saurus*

ARGENTINA.
Argentine

7. A. *Sphyræna* EUROPEAN A.

Order *BRANCHYOSTEGI.*



1.O. *turritus*
EARED TR.
2.O. *triqueter*
TRIANGULAR TR.
3.O. *nasus*
SNOUTED TR.

4.O. *bicaudalis*
BICAUDATE TR.
5.O. *quadricornis*
FOUR HORNED TR.
6.O. *cornutus*
HORNED TR.

ENTOMOLOGY

Order Coleoptera

NB Cistela is a Fabrician genus & answers to the Cryptocephalus of Linnæus

GENUS *BYRRHUS* G *ANTHRENUS* G *CISTELA* G *SILPHA* G *MELYRIS*









1 B pilula
2 A schrophulariæ
3 C pallida
4 C læta
5 C lepturoide
6 S germanica
7 S vespillo
8 S thoracica







9 S humator
10 S obscura
11 Squadrimaculata
12 S sinuata
13 M viridis
* *Magnified*

G. Fairman, Sculp.

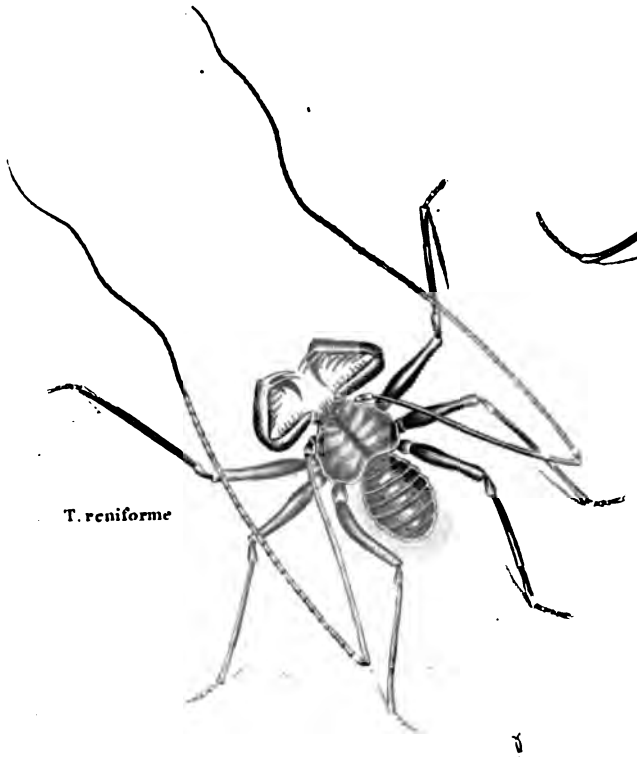
ENTOMOLOGY.

Linn. Syst.

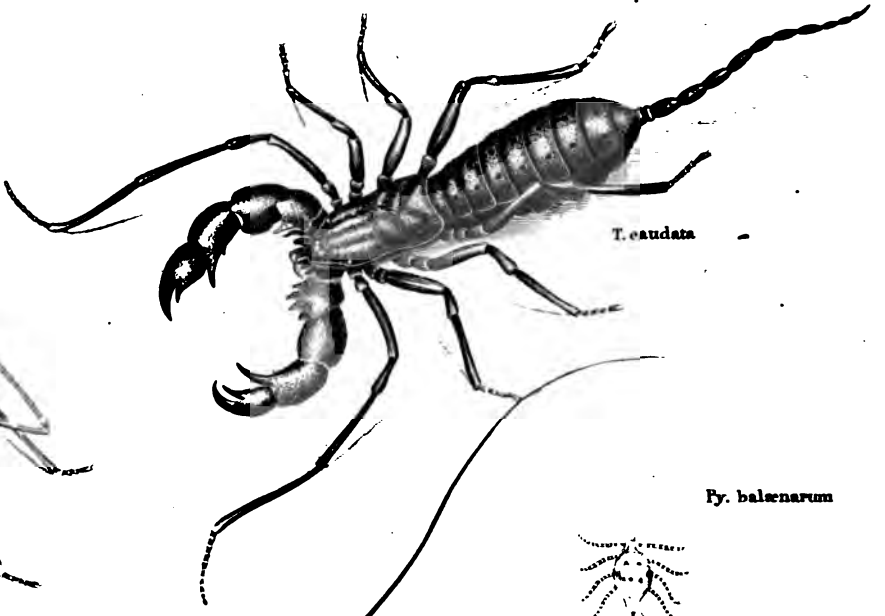
Order Aptera.

PLATE

GENUS *TARANTULA. G. PHALANGIUM. G. NYMPHION. G. PYCNOGONUM.*



T. reniforme



T. caudata

Py. balænarum



Ph. cancroides
natural size

N. grossipes



T. reniforme

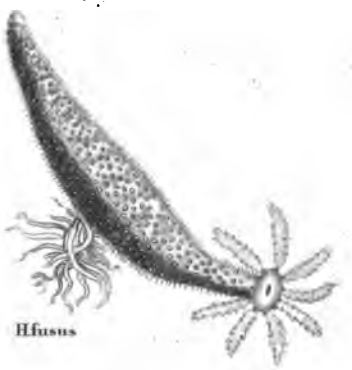
Ph. cancroides

Ph. cornutum



Py. hirsutum


L.anserifera
L.anatifera



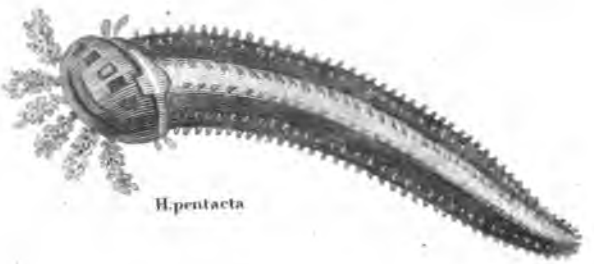
H.fusus



H.fusus



H.penicillus



H.pentacta

H.elegans



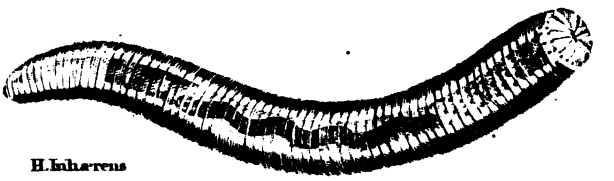
H.squamata

H.Inhærens



H.squamata

with tentacula expanded



H.Inhærens



Under Surface

FIG. 5. *Esox brasiliensis*, LINN. *Hemiramphus brasiliensis*, CUV. Brazilian Pike.

This fish attains something over a foot in length, and is much esteemed in Brazil.

The genus Esox of Linnæus, (to which the three last named species belong) embraces a great number of fishes, all of which are extremely voracious; their intestine is short, and without cœca; and many of them ascend rivers.

FIG. 6. *Elops saurus*, LINN. and CUV.

This species was first described by Sir Hans Sloane, who found it in the seas of the West Indies. It is about fourteen inches long, and has a strong general resemblance to a salmon.

FIG. 7. *Argentina sphyræna*, LINN. *Scopelus Humboldtii*, CUV. The European Argentine.

This is the only species known; its tail is singularly loaded with the silvery substance called *nacre*, which is employed in colouring pearls. It is common in the Mediterranean.

PLATE CXXXV.—ICHTHYOLOGY.

The genus OSTRACION, (Trunk Fish) is one of the most remarkable in the fish tribe. Their head and body, instead of scales, are covered with bony plates, so articulated as to form a sort of inflexible shield, which completely invests them. They have but little flesh, but the liver is large in proportion to the body, and, in some species, produces much oil. Some of them are considered poisonous.

FIG. 1. *Ostracion turritus*, LINN. and CUV. This fish is nearly quadrangular, and has a spine over each eyebrow, and four on each side of the belly. It inhabits the Red Sea.

FIG. 2. *Ostracion triqueter*, LINN. and CUV. Inhabits both the Indian and American Seas, and is much esteemed for the table.

FIG. 3. *Ostracion nasus*, LINN. and CUV. Snouted Trunk Fish. Of an oblong form, and with a rounded, prominent head. Inhabits the seas of India and America.

FIG. 4. *Ostracion bicaudalis*, LINN. and CUV. This species has two subcaudal spines, and inhabits the Indian Ocean.

FIG. 5. *Ostracion quadricornis*. Four-horned Trunk Fish. Of a triangular form, with two frontal and two subcaudal spines, whence its name. It comes from Guinea.

FIG. 6. *Ostracion cornutus*, LINN. and CUV. Horned Trunk Fish. This fish, although its body appears misshapen, is covered by beautiful hexagonal scales. It inhabits the seas of India and America.

PLATE CXXXVI.—ENTOMOLOGY.

COLEOPTERA.

FIG. 1. *Byrrhus pilula*, LINN. and LAT.

From three to four lines in length; black beneath, and bronze-coloured above, with black spots mingled with lighter ones, arranged in spots. Inhabits Europe.

FIG. 2. *Byrrhus scrophulariæ*, LINN. *Anthrenus scrophulariæ*, LAT.

This insect is represented of its natural size in the right-hand figure, the left one being greatly magnified. It lives, in its perfect state, on flowers; but its larvæ eat all desiccated animal matters.

FIG. 3. *Cistela pallida*, LINN.

FIG. 4. *Cistela læta*, LINN.

FIG. 5. *Cistela lepturoides*, LINN.

FIG. 6. *Silpha germanica*, LINN. *Necrophorus germanicus*, LAT.

FIG. 7. *Silpha vespillo*, LINN. *Necrophorus vespillo*, LAT.

FIG. 9. *Silpha humator*, LINN. *Necrophorus humator*, LAT.

These three species of Linnæan Silphæ belong to the genus Necrophorus of Fabricius. They possess some singular instincts. When they find the dead body of a mole, mouse, or other small quadruped, they undermine it with a hole sufficient for its reception; and when the body is thus secured, they deposit in it their ova, and thus the larvæ find their food in the very nidus in which they are hatched. These insects, as well as many others that inhabit dead bodies, exhale a strong odour of musk. Their sense of smell must be extremely acute, for gardeners have observed, that very soon after a mole has been killed, the Necrophori surround it, although they were previously unnoticed in the same locality.

FIG. 8. *Silpha thoracica*, LINN. and LAT.

FIG. 10. *Silpha obscura*, LINN. and LAT.

FIG. 11. *Silpha quadripunctata*, LINN. and LAT.

FIG. 12. *Silpha sinuata*, LINN. and LAT.

The above four species of true Silpha, live chiefly in carrion, and diminish its noxious effluvia. Some are seen on the stems of wheat, and others on trees, where they destroy caterpillars.

FIG. 13. *Melyris viridis*, LINN. and LAT.

PLATE CXXXVII.—ENTOMOLOGY.

FIG. 1. and 2. *Tarantula reniformis*, LINN. *Phrynus reniformis*, LAT.

FIG. 3. *Tarantula caudata*, LINN. *Thelyphonus caudatus*, LAT.

FIG. 4. *Phalangium carnutum*, LINN. and LAT.

FIG. 5. *Phalangium cancroides*, LINN. *Chelifer cancroides*, LAT. Natural size.

FIG. 6. Same, magnified.

FIG. 7. *Nymphon grossipes*, LINN. and LAT.

FIG. 8. *Pycnogonum hirsutum*, LINN. and LAT.

FIG. 9. *Pycnogonum balænarum*, LINN. and LAT.

PLATE CXXXVIII.—CONCHOLOGY.

The genus ANATIFA was embraced in that of LEPAS, in the Linnæan arrangement. It is characterized by a compressed mantle, open on one side, suspended to a fleshy tube, varying in the number of shelly pieces with which it is covered.

FIG. 1. *Lepas anserifera*, LINN. *Anatifa anserifera*, LAM.

Shell compressed, five-valved, striated, and attached to a peduncle. Inhabits the Atlantic Ocean.

FIG. 2. *Lepas anatifera*, LINN. *Anatifa anatifera*, LAM.

Shell five-valved, compressed, and smooth. Inhabits most seas, attaching itself to decayed timber, and to the bottoms of ships. This shell owes its specific appellation to the fable which represents its producing the *Bernacles* and Macreuses,—a story founded on the rude resemblance that has been observed to exist between the pieces of this shell and a bird. CUVIER, *Regne Anim.* v. 2.

PLATE CXXXIX.—ZOOLOGY.

VERMES, LINN.

The genus HOLOTHURIA, of which the annexed plate offers several remarkable species, have an oblong coriaceous body, open at each end; at the anterior extremity is the mouth, sur-

rounded by tentaculæ, and susceptible of being completely retracted. At the opposite extremity is an aperture, at which the rectum and respiratory organ terminate. These animals are of the marine kind, and are supposed to be viviparous. They live on small fishes, worms, &c., and are possessed of very resplendent colours.

Fig. 1. *Holothuria elegans*, Linn. and Cuv. Body papillated, reddish above, white beneath; with 20 branched tentaculæ. Inhabits the seas of Norway and Denmark.

Fig. 2. and 3. *Holothuria fusus*, Linn. and Cuv. With 10 tentaculæ; body fusiform and downy. Lives in the mud of the Norwegian seas.

Fig. 4. *Holothuria pentactes*, Linn. and Cuv. With 10 ramified tentaculæ; body with 5 rows of papillæ. Found in the seas of Europe.

Fig. 5. *Holothuria penecillus*, Linn. and Cuv. With 8 branched tentaculæ; body bony, and five-sided. Inhabits the seas of Norway.

Fig. 6. and 7. *Holothuria squamata*, Linn. and Cuv. With 8 slightly-branched tentaculæ; body rough above, beneath soft. Native of Norway and Greenland.

Fig. 8. and 9. *Holothuria inhærens*, Linn. and Cuv. Body brown, with whitish stripes, and 12 tentaculæ. Inhabits the Red Sea.

PLATE CXL.—QUADRUPEDS.

Order Feræ. Genus Viverra.

Generic character. The incisory teeth $\frac{6}{6}$; the canine teeth $\frac{1}{1}$; the grinders $\frac{6}{6}$; total 40; in the upper jaw, three false grinders, which are a little conical and compressed; a large carnivorous bicuspid tooth, and two tuberculous ones; in the lower jaw are four false grinders; one bicuspid, and one large tuberculous tooth behind; the head is long; the muzzle pointed; the nostrils pierced on the sides of the nose; the pupils of the eyes capable of contracting themselves almost into a line; the tongue aculeated; the feet with five toes, and the claws partly retractile; with an oval pouch, more or less deep.

Fig. 1. *Zibet. Viverra Zibetha*, Linn. and Cuv.

This animal has been by some authors considered as merely a variety of the civet; but is, nevertheless, a distinct species. The ears of the zibet are longer and more erect than those of the civet; its muzzle is thinner and more flattened; its body longer and not so thick; its tail is considerably longer, and remarkable for the fine circular rings with which it is marked, resembling in this respect the genet; it has none of the upright hairs on the back of the neck and spine; and its hair is shorter and softer.

The perfume of the zibet is also much more powerful than that of the civet. It is a thick secretion, like pomatum.

Fig. 2. *Fossane. Viverra Fossa*, Linn. and Cuv.

The fossane appears to be so nearly allied to the genet, that it might almost pass for a variety of that animal. Its colours, however, are somewhat bolder or more contrasted than in the genet, and the rows of spots along the sides still more regularly disposed. Beneath and above each eye is commonly a white patch; and from the hind parts of the head towards the back and shoulders run four black lines. The whole under side of the body is of a dingy white: the tail is annulated with black and white. This animal is a native of Madagascar, Guinea, Bengal, Cochin-china, and the Philippine islands. It is said to be possessed of considerable fierceness, and to be difficultly tamed. It destroys poultry in the manner of the common weasel. When young, it is said to be good food. Its size is that of the genet.

Fig. 3. *Ichneumon. Viverra Ichneumon*, Linn. *Herpestes Ichneumon*, Cuv. *Herpestes Pharaonis*, Desmarest.

Illiger has formed a new genus from this animal, which he calls *Herpestes*, the generic character of which is:—the incisory teeth $\frac{6}{6}$; the canine teeth $\frac{1}{1}$; the grinders $\frac{6}{5}$; total 36; the body is much elongated, and with a large anal pouch; feet with five toes, somewhat palmated, and the nails capable of being partly retracted.

This astonishing creature is about the size of a domestic cat,—the tail being as long as the body. Its fur is pale reddish gray, each hair being encircled with alternate rings of this and mouse colour. The muzzle long, taper, pointed, and black; the ears almost naked, very small, and rounded; the eyes of a fiery red. The tail is very thick at its insertion, gradually tapering to an acute point, with a slight tuft. The legs are short, the feet small and black, and furnished with extremely sharp claws.

In Egypt and India, the ichneumon is as domestic as our cat, and is kept by the natives for ridding their houses of rats and mice, at which it is very expert. No animal has a stronger propensity for the destruction of every thing living, than this creature; and it possesses courage, strength, and agility, superior to every other animal of its size. It fearlessly attacks the most deadly serpents, and preys upon every noxious reptile of the Torrid Zone, which it seizes and kills with great avidity. That fatal snake, the *cobra di capello*, (*coluber naja*, of Linnæus,) frequently falls a victim to it. It is particularly fond of crocodile's eggs, which it digs out of the sand; and often kills young crocodiles themselves. In its conflicts with poisonous serpents, they sometimes bite the little creature, in which case, it immediately flies to the root of a certain plant, which is said to counteract the effects of poison. This plant is called by the Indians after the animal. From the great utility of the ichneumon, in ridding their country of so many noxious and troublesome animals, the ancient Egyptians held this creature in religious veneration, worshipping and ranking it among those deities that were most propitious to them.

The adroitness with which the ichneumon seizes the poisonous serpents, is not one of the least remarkable features of its history; for it generally contrives to catch the serpent by the throat in such a manner, that it cannot retaliate on its little enemy. Lucan, in his poem of Pharsalia, written about the year 62 of the Christian era, beautifully describes the manner in which the ichneumon combats the Egyptian asp,—a serpent whose bite is most deadly. The passage has been thus translated:—

> Thus oft th' ichneumon, on the banks of Nile,
> Evades the deadly aspic by a wile;
> While artfully his slender tail is play'd,
> The serpent darts upon the dancing shade;
> Then turning on the foe, with swift surprise,
> Full on the throat the nimble seizer flies;
> The gasping snake expires beneath the wound,
> His gushing jaws with poisonous floods abound,
> And shed the fruitless mischief on the ground.

The ichneumon is said to swim and dive with much dexterity, in a wild state, and in this exercise to be much like an otter, and able to remain under the water a long time. He generally frequents the banks of rivers, but, when the waters are flooded, seeks food on higher situations. When he sleeps, he coils himself up like a ball; and it is with great difficulty he can be roused from his slumbers. In feeding, he frequently sits up like a squirrel, and will catch with dexterity any thing thrown to him. The voice of this animal is a soft murmur, which he seldom emits but when irritated. He is short-lived; and in temperate climates it is with much difficulty he can either be reared, or preserved alive, generally falling a victim to the change of climate.

QUADRUPEDS

ORDER. FERÆ. GENUS VIVERRA.

PLATE 140.



1V: Zibetha. Zibet. 2V: Foſsa. Foſsane. 3V: Ichneumon. Ichneumon.
4V: Nasua. Brasiliar. Weesel. 5V: Civetta. Civet.

Change of Temper.—"I had," says M. d'Obsonville, in his *Essay on the Nature of various Animals*, "an ichneumon very young, which I brought up. I fed it at first with milk, and afterwards with baked meat, mixed with rice. It soon became even tamer than a cat; for it came when called, and followed me, though at liberty, into the country. One day I brought to him a small water-serpent alive, being desirous to know how far his instinct would carry him, against a being with which he was hitherto totally unacquainted. His first emotion seemed to be astonishment, mixed with anger; for his hair became erect: but, in an instant after, he slipped behind the reptile, and, with a remarkable swiftness and agility, leaped upon its head, seized it, and crushed it between his teeth. This essay, and new aliment, seemed to have awakened in him his innate and destructive voracity, which, till then, had given way to the gentleness he had acquired from his education. I had about my house several curious kinds of fowls, among which he had been brought up, and which, till then, he had suffered to go and come unmolested and unregarded; but, a few days after, when he found himself alone, he strangled them every one, ate a little, and, as appeared, drank the blood of two."

Singular display of Caution.—Mr. Percival saw an experiment tried in a close room, where the ichneumon, instead of attacking a poisonous serpent that was presented to him, did all in his power to avoid it. On the snake being carried out of the house, however, and laid near his antagonist in the plantation, he immediately darted at the snake, and soon destroyed it. It then suddenly disappeared for a few minutes, and again returned, as soon as it had found and ate of the herb which is an antidote to the poison of snakes.

FIG. 4. *Brazilian Weasel. Viverra Nasua*, LINN. *Nasua vulgaris*, CUV.

The length of the weasel does not exceed seven inches from the nose to the tail, which is only two inches and a half long, and ends in a point; the height of the animal is little more than two inches and a half; so that its length is nearly four times its height.

The usual colour of the weasel is pale reddish brown on the back, sides, and legs; the throat and belly are white; on each side, under the corners of the mouth, is a brown spot; its ears are small and rounded; and its eyes small, black, and sparkling; it has long whiskers, like a cat; and its teeth are exceeding sharp, so that it bites with great keenness.

The weasel is a lively and active animal, and common in all parts of Britain; and, being of a fierce and bold disposition, proves exceedingly destructive to our farm-yards and warrens. It devours eggs with much voracity. In this operation, it makes a small hole in the end of the egg, and sucks the contents out, leaving the shell entire: whereas, a rat usually drags the egg from the nest, and either breaks it to pieces, or makes a large hole in it; from which distinction, the farmer may readily guess which of these was the depredator.

Although the weasel is but a slender animal, yet it is more than a match for the largest rat, to which species he is a mortal enemy, and frequently proves extremely useful to the farmer, in ridding his stack-yards and barns of these destructive vermin, as well as mice; on which account its company is often courted by the farmer. It is even more useful than the cat in destroying rats; for, from the slenderness of its body, it can pursue them into their holes, where they are soon killed. It is a destructive enemy to pigeons, as it creeps into the holes of a dovecot in the evening, and surprises its prey while they are asleep; and, from the peculiar construction of its body, there are few situations it is incapable of reaching, for it can clamber up an almost perpendicular wall.

It is said that the weasel prefers meat which has become putrid, to that which has been just killed. Buffon gives an illustration of its attachment to putrid substances: He says, that a weasel, with three young ones, were taken out of the carcase of a wolf that had been hung on a tree by the hind feet. The wolf was almost entirely putrefied; and the weasel had made a nest of leaves and herbage for her young, in the thorax of the corrupted carcase.

The female brings forth in spring, and usually produces four or five at a litter. The young ones are blind at birth, but soon receive their sight, and are not long in being able to follow the dam in her predatory excursions.

The weasel is of a wild and intractable nature, being exceedingly difficult to tame. When kept in a cage, it seems in a perpetual state of agitation—is terrified at the sight of all who approach to look at it, and generally endeavours to hide itself behind the straw, or other substances which may be at the bottom of its cage. There are, however, instances on record of weasels being completely domesticated.

A domesticated Weasel.—Although Buffon was of opinion, that the weasel was an animal incapable of domestication, we have the following interesting account of one, in a letter of Mademoiselle de Laistre:—"If I pour some milk into my hand," says she, "it will drink a good deal; but, if I do not pay it this compliment, it will scarcely take a drop. When it is satisfied, it generally goes to sleep. My chamber is the place of its residence; and I have found a method of dispelling its strong odours, by perfumes. During day, it sleeps inside a quilt, entering by a place that is unsewed in its edge, which it accidentally discovered. At night, I keep it in a wired cage, which it always enters with much reluctance, but leaves with joy. If the servant sets it at liberty before I am up in the morning, after a thousand gambols, it comes into my bed, and reposes in my hand, or on my bosom. If I am up before it is let out, it will fly to me in rapture, and spend half an hour in caressing me, playing with my fingers, and nibbling at them with its teeth, like a little dog; leaping on my head and on my neck, and then running round my arm with the softness and elegance of a squirrel. Such is its agility, that it will leap into my hands, although upwards of a yard distant, if I present them to it. It exhibits much adroitness and cunning to obtain any wished-for object; and it is so capricious at times, as to perform certain acts, apparently from contradiction. It seems at all times exceedingly desirous of being noticed, watching my eye during all its little pranks, to see if I observe it. If I am inattentive to its sports, it seems to have no pleasure in them, immediately desists, and lays itself down to repose. It is so lively, that the moment I awake it, however sound its sleep may be, it instantly resumes its gambols with as much spirit as before it slept. It never is out of temper, unless when much teased, or when under confinement, which it mortally detests; in which case, it displays its displeasure by a kind of low murmur, quite opposed to the sound of its voice when pleased.

"This little creature can distinguish my voice amid twenty others, and springs over every one in the room, till it has found me. Nothing can exceed the lively and pleasing way it caresses me with its two little paws; it frequently pats me on the chin, in a manner that expresses the utmost fondness. This, with a thousand other kindnesses, convinces me of the sincerity of its attachment. He is quite aware of my intention, when dressed, to go out, and then it is with much difficulty I can rid myself of him: on these occasions, he will conceal himself behind a cabinet near the door, and spring on me as I pass, with astonishing quickness.

"His vivacity, agility, and voice, with the manner he utters it, have a strong similitude to those faculties in a squirrel. In the summer season, he runs about all night, squeaking; but, since the cold set in, he has desisted from this practice, but has sometimes expressed this particular sound, when rolling on my bed in the sunbeams.

"It seems extremely probable that the weasel sips the dew, judging from the remarkable manner he drinks milk from my

hand. He will never drink water when he can get milk, and then in such a small way, that he appears only to do it to cool his tongue, for he evinced fear on several occasions when water was presented to him. During the summer showers, I caught some rain-water, and endeavoured to get him to enter it to bathe himself; but this he would not do. I then dipt a piece of linen cloth in it; this seemed to afford him much pleasure, by rolling himself over it, which he did frequently.

"The curiosity of this little pet is unbounded, for it is impossible to open a drawer or box, without his roving through every part of them; if even a piece of paper or a book is looked at, he will also examine it with attention. Everything I take into my hand, he must run up to, and survey with an attentive scrutiny. I have a young dog and cat, with both of which he is very familiar; he will scamper over their necks, backs, and legs, without their offering him the smallest injury."

The Weasel and Eagle.—An eagle having seized a weasel, mounted into the air with its prey, and was soon after observed to exhibit symptoms of distress. Its little enemy had extricated itself so far, as to be able to bite the eagle in the throat, and kept its hold with such pertinacity, that he brought the eagle to the ground; and thus the weasel was afforded an opportunity of escaping.

Unprovoked Attack.—In January, 1818, a labourer in the parish of Glencairn, Dumfriesshire, was suddenly attacked by six weasels, which rushed upon him from an old dyke, in the field where he was at work. The man, alarmed at such a furious onset, instantly betook himself to flight, but he soon found he was closely pursued; and, although he had about him a large horse-whip, with which he endeavoured, by several back-handed strokes, to stop them, yet, so eager was their pursuit, that he was on the point of being seized by the throat, when he luckily noticed at some distance the fallen branch of a tree, which he made for, and, hastily snatching it up, manfully rallied upon his enemies; and, as fortune favours the brave, he had such success, that he killed three of them, and put the remaining three to flight. The reader may have some idea of the man's danger, when it is known, that two of them are a match for a dog.

United Defence.—One fine summer evening, about thirty years ago, my father was returning from Gilmerton, near Edinburgh, by the Dalkeith road. He observed, on the high ground, at a considerable distance, betwixt him and Craigmillar Castle, a man, who was leaping about, performing a number of antic gestures, more like those of a madman than of a sane person. After contemplating this, apparently, absurd conduct, my father began to think it might be some unfortunate maniac, and, climbing over the wall, made directly towards him; when he got pretty near, he perceived that the man had been attacked, and was defending himself against the assaults of a number of small animals, which he, at first, took for rats, but which, in fact, turned out, on getting closer, to be a colony of from fifteen to twenty weasels; and which the unfortunate man was tearing from him, and endeavouring to keep from his throat. My father joined in the combat, and, having a stick, contrived to hit several of them, and laid them lifeless. Seeing this, the animals became intimidated, and speedily fled towards a rock hard by, and disappeared in its fissures. The gentleman was nearly overcome with fatigue and exhaustion, having been engaged in his struggle with the weasels, as far as he could guess, upwards of twenty minutes: and, but for the fortunate and timely assistance of my father, he said he must have inevitably fallen a victim to their fury, as he found himself quickly losing strength, from the violence of his exertion. His chief attention was turned to keeping them from his throat, to which they seemed instinctively to direct their course. He was a powerful man, otherwise he must have sunk under their ferocity. He had squeezed two to death, while tearing them from him. His hands were much bitten, and were streaming with blood from the wounds.

The account he gave of the commencement of the affray was, that he was walking slowly through the park, when he happened to see a weasel; he ran at it, and made several unsuccessful attempts to strike it with a small ratan he had in his hand: on coming near the rock above mentioned, he got betwixt it and the animal, and thus cut off his retreat; the weasel squeaked aloud, when an instantaneous sortie was made by the whole colony, and the attack commenced.

Captain T. Brown.

FIG. 5. *Civet. Viverra Civetta*, LINN. and CUV.

The length of the civet, from the nose to the insertion of the tail, is somewhat more than two feet, and its tail is upwards of a foot long. The colour of its fur is ash gray, marked with large blackish or dusky spots; the hair is of a coarse texture, and, along the back, stands somewhat erect, like a mane; the body is rather thick; the forehead broad, the muzzle acute, and black at the tip; there are three black stripes which proceed from the back of the ear, and terminate at the shoulders and throat.

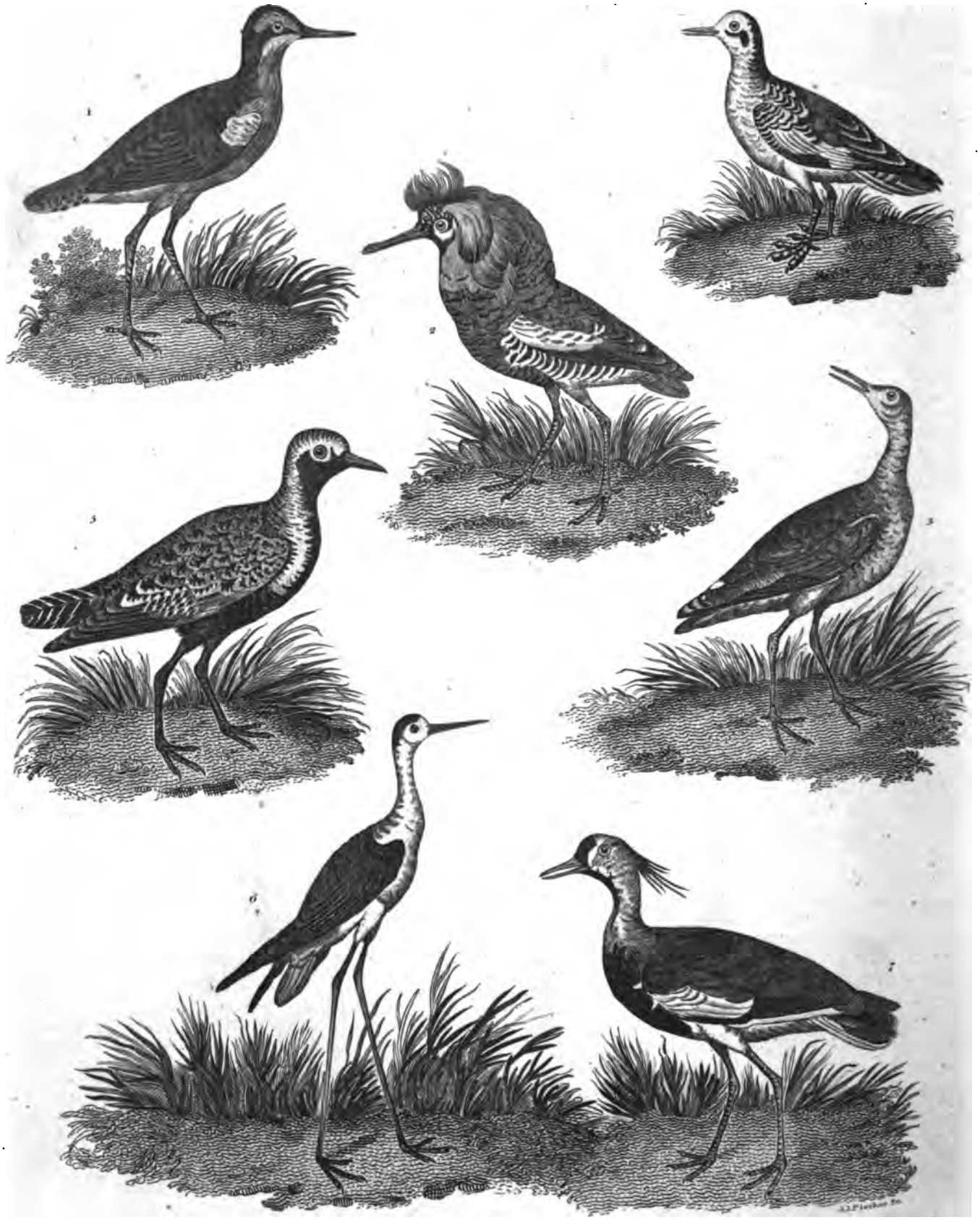
The civet is remarkable for the drug, or perfume, procured from it, called civet, having a strong resemblance to musk, with which it has been frequently confounded. Its odour, however, is considerably different, and its medical properties also somewhat dissimilar. Although this animal is originally a native of Africa and Asia, yet it lives in temperate countries; and numbers of them are kept in Holland, for the purpose of collecting this very costly perfume. The civet procured at Amsterdam, is considered more valuable than that got from the Levant or India, being freer from adulteration: its average value is about fifty shillings an ounce; but, like other things, liable to a fluctuation in price. To collect civet, the animal is put into a cage so narrow, that it cannot turn itself. The cage is then opened at one end, the creature is pulled back by the tail, and securely held by the hind legs. A small spatula is then introduced into the pouch containing the perfume, which is carefully scraped out, and put into a bottle properly stopped. This operation is performed two or three times a-week. In a state of nature, the animal empties the bag of this secretion spontaneously.

The perfume of the civet is so strong, that it infects every part of the beast, and so completely penetrated with it are the skin and hair, that they retain its odour long after being removed from the body. If the animal is irritated, the scent becomes very powerful; and even in ordinary, it cannot be kept long in a room, without becoming almost insupportable.

In a native state, the civet feeds on birds and small animals. It is naturally savage and ferocious, but is easily tamed; and when so, its food consists principally of boiled flesh, eggs, rice; and fish is an especial favourite with it. It requires but little drink.

The civet is possessed of great agility, leaps with all the nimbleness of a cat; and, like that animal, takes its prey by pouncing upon it. It has been frequently known to carry off poultry from a barn-yard. The voice of the civet is stronger than that of a cat, resembling the cry of an enraged dog. It is a prolific animal in its wild state, but never breeds in captivity.

Effects of Carelessness.—M. Barbot had a tame civet, at Guadaloupe, which, through the carelessness of a servant, was allowed to be a whole day without food. On the following morning, the hungry animal gnawed through the wood of his cage, and entered a room in which M. Barbot usually sat, where he was writing at the time. The civet stared about with a ferocious and sparkling eye for some time, and then made a leap at a beautiful American parrot, which was perched on a piece of wood, fixed in the wall, about six feet from the ground. Before Barbot could reach the bird, the civet had torn his head off, and had actually begun to feast on his victim.



GENUS *TRINGA*
Sandpiper

1.T. *Leucoptera* WHITE WINGED SP.
2.T. *Pugnax* RUFF & REEVE
4.T. *Lobata* GREY PH. OF TROPE

G. *CHARADRIUS*
Plovor

5.C. *Apricarius* HWARGRIM P
6.C. *Himanticpus* LONG LEGGED P.
7.C. *Spinosus* SPUR WINGED P.

PLATE CXLI.—ORNITHOLOGY.

Order GRALLAE. Genus TRINGA. Genus CHARADRIUS.

FIG. 1. *White-winged Sandpiper. Tringa leucoptera*, LINN. and CUV.

"This bird," says Latham, "is a trifle bigger than the purre: length eight inches and a half: beak one inch, cinereous: irides dusky brown: over the eye a pale streak: the head, hind part of the neck, back, and wings, are brownish-black: lesser wing-coverts dusky black: from the bend of the wing, an oblique streak passes over the wing-coverts; the greater ones mixed ferruginous and black: quills black, and reach almost to the end of the tail: the throat, breast, belly, and rump are rufous: vent dirty yellow: the two middle tail-feathers deep brownish-black; the others barred black and rufous; the outer feathers ashy on the exterior webs: legs dusky green. This inhabits Otaheite, near the rivers, and is called *Torowée*: also met with at Eimeo, or York Isle, and is there called *Te-te*."

"This bird varies. In one specimen which came under my view, the crown of the head was dusky: the line over the eye ferruginous; and a tinge of the same was visible throughout the whole of the plumage: beak and legs yellowish. In another variety, (figured by Dr. Latham) all the lesser wing-coverts were white: four of the middle tail-feathers plain; the others barred as usual: but all had the streak over the eye."

FIG. 2. *Male Ruff. Tringa pugnax*, LINN. *Machetes pugnax*, CUV.

FIG. 3. *Female of ditto*, or *Reeve.*

A most variable species: in length about eleven inches and a half: in the summer the male has his face naked, and covered with warts; his occiput adorned with long feathers, and his throat with a large frill, composed of beautiful feathers: these feathers, and those on the occiput, are usually contrasted with the colours of the rest of the plumage, which is generally varied with red, ash-colour, black, brown, white, and yellow: the frill and occipital feathers are also subject to infinite variations of colour: the beak is orange-yellow: the warts on the face are yellow or reddish; and the feathers of the frill vary in length, according to the age of the bird. The female is smaller, and is destitute of the long plumose feathers on the occiput and throat: the upper parts of the body are brown-ash, varied with several black feathers glistening with a steel lustre: the throat and breast the same, but brighter: the belly and vent white: the beak black: the legs yellowish or greenish. The autumnal and winter plumage is as follows: the face becomes clothed with feathers, and the male has those of the neck and throat short: the throat, fore part of the neck, belly, and the rest of the under parts of the body are pure white: the breast is reddish, spotted with brown: the plumage of the upper parts is most commonly brown, varied with black spots and edged with reddish: the longer wing-coverts, the quills, and the two middle tail-feathers are rayed with brown, black, and red: the beak is brownish: the legs are yellowish, tinged with greenish-brown or reddish: the irides are brown. The female, at these periods, is about one-third less, her plumage is more cinereous, and the fore part of the neck is rarely pure white: the beak is black, and the legs very dark.

The young greatly resemble the females, but the colours on the fore part of the neck and on the breast are dull ashy-red: the feathers on the head, those of the back, the scapulars, and the greater wing-coverts are dusky-black, bordered deeply with red and yellowish: the lesser wing-coverts are edged with reddish-white: the throat, belly, and vent, are pure white: the beak is black: the legs are greenish.

The male only of this pugnacious bird is called the ***Ruff***, the female being denominated the ***Reeve***. The most remarkable circumstance attending the history of this species is its quarrelsome disposition; which is said to arise from the number of males greatly exceeding that of the females, as, upon their arrival in England, in the spring, the males each fix upon a small hillock or dry grassy spot, in the marshes, about which he runs around till he has almost trodden the space bare; and the moment a female comes in sight, all the males within a certain distance commence a general battle, placing their beaks on the ground, spreading the feathers of the neck, and using the same action as a cock; and their combats are described as being both desperate and of long continuance; but, at the end, the female generally becomes the prize of the victor. It is during these battles that the fowlers take the opportunity of seizing them, which they do in great numbers, by means of clap-nets. An erroneous opinion prevails, that the fattening of ruffs, when in confinement, should take place in the dark, lest the admission of light should set them to fighting: the fact is, that every bird, even when kept in a room, takes its stand, as it would in the open air; and if another invades its circle, a battle ensues. A whole roomfull of them may be set into fierce contest by compelling them to shift their stations; but, after the cause has subsided, they resume their circles and become pacific. In confinement, they do not lose their pugnacious disposition; and if a basin of bread and milk, or boiled wheat, is set before them, it is instantly contended for, and they would starve in the midst of plenty, if several dishes of food were not placed among them, at a distance from each other. Montagu observes of some that he kept in confinement, that the males paid no attention to the reeves, except to drive them from their food; and never attempted to dispute with any other species, but would feed out of the same dish with land rails and other birds confined with them, in perfect amity.

These birds are highly esteemed as a most delicious dish, and are sought after with great eagerness by the fowlers, who live by catching them: but, before they are offered for sale, they are generally put up to fatten, for about a fortnight, and are, during that time, fed with boiled wheat, and bread and milk, mixed with hemp-seed; by this mode of treatment, they speedily become very fat, and are often sold for a high price: they are dressed after the same manner as the woodcock.

They are birds of passage; and arrive in the fens of Lincolnshire, the Isle of Ely, and the East Riding of Yorkshire, in the spring, in great numbers; and about the beginning of May, the female forms her nest on a clump, in the most swampy parts of the marshes, of a coarse grass; she lays four eggs, greatly resembling those of the snipe and redshank; they are greenish-white, marked with rusty spots. After the young are produced, and the autumn arrives, both sexes leave the country, and are supposed to retire southward. During the summer season, they are common in the fens of Denmark, Sweden, and Russia, and are also found in other more northern regions, even as far as Iceland; and are nowhere so abundant as in the extensive marshes of Holland. They feed on worms and aquatic insects.

FIG. 4. *Gray Phalarope. Tringa lobata*, LINN. *Phalaropus lobatus*, CUV.

Length about eight inches and a half: during the summer, the beak is reddish-yellow at its base, and brown towards the tip: its irides are reddish-yellow: the head, nape, back, scapulars, and upper tail-coverts are dusky-brown, each feather being deeply edged with orange-red: above each eye is a yellow band: the wing-coverts are dusky, tipped with white; and on the wing is a transverse white band: the rump is white, spotted with black: the fore part of the neck, the breast, belly, vent, and inferior tail-coverts are red: the legs are dusky green. In the winter, the top of the head, the occiput, and the nape, are bright ash: the sides of the breast, the back, the scapulars, and the rump, are bright ashy-blue: all the feathers are dusky in the centre; and the longer ones of the scapulars are tipped with white: on the wing is a transverse white band: the tail-feathers are brown, edged with ash-colour: the forehead, the

sides of the neck, the middle of the breast, and the rest of the under parts, are pure white: the legs are lead-coloured: the beak is dusky. The young have a dusky spot, of a horse-shoe shape, on the occiput, and a band of the same colour passing through the eyes: the nape, back, scapulars, upper tail-coverts, and tail-feathers, are brown-ash; the feathers of the back, scapulars, and two middle ones of the tail, being deeply bordered with yellowish: the rump is white, varied with brown: the quills are edged with white; the wing-coverts are bordered and tipped with whitish-yellow: the forehead, throat, sides, and fore part of the neck, the breast, and under parts of the body, are pure white: the legs are yellowish-green: the beak is dusky-brown.

Abundant in the north-eastern parts of Europe, on the confines of the Frozen Sea, and in Siberia, and other parts of Northern Asia, particularly about the borders of the Caspian Sea, where it is said to congregate: it is likewise very numerous in North America. In England it is very rare, and is only occasionally taken during its migrations, and appears to be solitary. Montagu says, "He once had an opportunity of seeing one swimming in a small pool of water left by the tide on the Sussex coast. It was continually dipping its beak into the water, as if feeding upon some insects, and so intent as to suffer him to approach within a few yards. It never attempted to dive, and when disturbed, only flew a small distance, very like the purre."

It breeds in the arctic regions, and its food consists of winged insects, worms, and mollusca.

FIG. 5. *Alwargrim Plover. Charadrius apricarius*, LINN. *Vanellus helveticus*, CUV.

The beak of this bird is one inch in length, and black: eyelids dusky: irides brown: the plumage on the upper parts of the body is black, spotted with orange: at the base of the upper mandible the feathers are black: the forehead, between the eyes, white, passing over each eye in a line down the sides of the neck to the breast, where it unites to a band of the same, across the latter: all the fore parts of the neck, breast, and under parts of the body, are also black, the band on the breast excepted: the rest is spotted with white: the secondaries, quills, and tail, are barred with brown and black: legs black. The male has the temples black; in the female they are dusky.

This species inhabits the most northern parts of Europe, Asia, and America, being found in Sweden, Denmark, Greenland, Russia, Siberia, Hudson's Bay, and New-York. In Greenland, it appears early in the spring, rather sparingly, on all the southern lakes, feeding upon worms and the buds of the black-berried heath: after breeding, it returns southward. Its flesh is said to be exquisite. It is called in America the Large Whistling Field Bird, from its note, which is very shrill.

FIG. 6. *Long-legged Plover. Charadrius himantopus*, LINN. *Himantopus vulgaris*, CUV.

This remarkable bird measures, from the end of the beak to that of the tail, thirteen inches, but to the end of the claws, nearly eighteen: its beak is nearly two inches and a half long, slender, and black: the irides are red: the forehead, round the eyes, the neck, breast, and all the under parts, are pure white, shaded on the breast and belly with rose-colour; the occiput and nape are black, or dusky, spotted with white: the back and wings are black, glossed with green: the tail is ash-colour: the legs are deep vermilion. In the old males, the nape (and sometimes the occiput) becomes white. The female is smaller: the black on the back and wings is not glossed with green, but is of a brownish cast. The young have the legs orange-colour: the feathers of the back and wings brown, edged with whitish; those on the top of the head, the occiput, and the nape, are grayish-black, with whitish borders.

A very general inhabitant of the temperate and tropical regions of the globe; occurring in plenty on the borders of the sea, and saline lakes of Asia, but less frequently on those of Europe and Africa: it is also found in America. Several specimens have been shot in Britain, at various periods. Sibbald mentions two being shot in Scotland, Pennant, one at Oxford, and White, of Selbourne, procured one (out of a flock of six) that was seen on the borders of a large lake, lying between Woolmer forest and the town of Farnham, in the county of Surrey. Another is recorded by Shaw to have been shot in Anglesea, in the year 1793.

Wilson has given some very interesting notices in his American Ornithology, relative to the manners, &c. of this bird, which we extract for the benefit of such readers as do not possess that valuable work. "It arrives," he says, "on the sea-coast of New-Jersey, about the 25th of April, in small detached flocks, of twenty or thirty together. These sometimes again subdivide into lesser parties; but it rarely happens that a pair is found solitary, as, during the breeding season, they usually associate in small companies. On their first arrival, and indeed during the whole of their residence, they inhabit those particular parts of the salt marshes, pretty high up towards the land, that are broken into numerous shallow pools, but are not usually overflowed by the tide during the summer. These pools or ponds are generally so shallow, that, with their long legs, these birds can easily wade them in every direction; and, as they abound with minute shell-fish and multitudes of aquatic insects and their larvæ, besides the eggs and spawn of others, deposited in the soft mud below, these birds find here an abundant supply of food, and are almost continually seen wading about in such places, often up to the breast in water. In the vicinity of these bald places, as they are called by the country people, and at the distance of forty or fifty yards off, among the thick tufts of grass, one of these small associations, consisting perhaps of six or eight pair, takes up its residence during the breeding season. About the first week in May they begin to construct their nests, which are at first slightly formed of a small quantity of old grass, scarcely sufficient to keep the eggs from the wet marsh. As they lay and sit, however, either dreading the rise of the tides, or for some other purpose, the nest is increased in height, with dry twigs of a shrub very common in the marshes, roots of the salt-grass, sea-weed, and various other substances, the whole weighing between two and three pounds. This habit of adding materials to the nest, after the female begins sitting, is common to almost all other birds that breed in the marshes. The eggs are four in number, of a dark-yellowish clay colour, thickly marked with large blotches of black. These nests are often placed within fifteen or twenty yards of each other; but the greatest harmony seems to prevail among the proprietors. While the females are sitting, the males are either wading through the ponds, or roaming over the adjoining marshes; but should a person make his appearance, the whole collect together in the air, flying with their long legs extended behind them, keeping up a continual yelping note of *click-click-click*. Their flight is steady, and not in short sudden jerks, like that of the plover. As they frequently alight upon the bare marsh, they drop their wings, stand with their legs half bent, and tremble, as if unable to sustain the burthen of their bodies: in this ridiculous posture they will sometimes stand for several minutes, uttering a crying sound, while, from the corresponding quiverings of their wings, and long legs, they seem to balance themselves with great difficulty. This singular manœuvre is, no doubt, intended to induce a belief that they may be easily caught, and so turn the attention of the person from the pursuit of their nests and their young to themselves. They will occasionally swim for a few feet when they chance, in wading, to lose their depth.

"The name by which this bird is known on the sea-coast, is the Stilt, or Tilt, or Longshanks. They are but sparingly dispersed over the marshes, having, as has been already observed, their particular favourite spots, while, in large interme-



GENUS PAVO.
(Peacock)

1. P. *cristatus*. COMMON PEACOCK.
2. P. *cristatus* v *varius*. VARIEGATED or PIED PEACOCK.
3. P. *cristatus* var. *albus*. WHITE PEACOCK.
4. P. *bicalcaratus*. IRIS PEACOCK.

diate tracts, there are few or none to be found. They occasionally visit the shore, wading about in the water and in the mud, in search of food, which they scoop up very dexterously with their delicately-formed bills. On being wounded while in the water, they attempt to escape by diving, at which they are by no means expert. In autumn their flesh is tender, and well tasted. They seldom raise more than one brood in the season, and depart for the south early in September. As they are well known in Jamaica, it is probable some of them may winter in that and other of the West India islands."

Dr. Horsfield found this species in the island of Java; but he observes that the Javanese specimens differ from those of Europe, in having the tint of cinereous on the tail much paler.

Fig. 7. *Spur-winged Plover. Charadrius spinosus*, Linn. and Cuv.

This bird is eleven inches and a half in length: its beak rather more than an inch, and black: top of the head shining black: cheeks, sides of the neck, and occiput, white; the latter slightly crested: the upper part of the neck, back, scapulars, rump, and upper tail-coverts, are chestnut-brown: wing-coverts similar to the back; but those farthest from the body, and the secondaries, are chestnut-brown, tipped with white: the greater quills are black: the throat, and fore parts of the neck, the lower part of the belly, and the vent, black: the breast and upper parts of the belly and of the vent, white: the tail white for two-thirds of its length, the rest black: legs deep brown.

The supposed female differs principally in having the whole of the neck white, the black on the throat only reaching for an inch down: breast and upper part of the belly dull black: the outer tail-feather tipped with white. Inhabits Russia, and the borders of the river Coic, near Aleppo.

PLATE CXLII.—ORNITHOLOGY.

Order Gallinae. Genus Pavo.

Pavo, *auctorum*.—There are but two species of Peacocks, which are amongst the most splendid birds, being of a beautiful form, and large size, and possessing the most magnificent and resplendent hues on their plumage: they are proud and quarrelsome, and feed on insects, fruit, and grain: they are natives of Asia, and one of them is domesticated in Europe and America.

Fig. 1. *Common Peacock. Pavo cristatus*, Linn.

This most splendid and magnificent bird is a native of India, and in its wild state has the following character: its length from the tip of the beak to the end of its tail is about four feet: its head is adorned with a crest, consisting of twenty-four feathers, which are only webbed at their tips, where they are of a fine rich golden-green colour; their shafts are whitish: above and beneath the eye is a streak of white: irides yellowish: the head, throat, neck, and breast, are green-gold, glossed with copper-coloured reflections: the back and rump the same, but more cupreous: the wing-coverts deep blue, glossed with green and gold: the belly and vent are dusky, tinged with greenish: the tail is of a gray-brown, edged with reddish-gray, and hidden beneath a train of the most elegant and enchanting colours, which arises upon the back; the two middle feathers of which it is composed are frequently upwards of four feet and a half in length, the others gradually diminishing on each side, and forming, when expanded, a superb fan, of the most resplendent hues: the shafts are white, and are furnished from their origin, nearly to the end, with divided iridescent barbs; at the extremity of these feathers the barbs unite, and form a flat extended vane, decorated with what is called the eye, which has in its centre a heart-shaped velvety black spot, surrounded with a circle of green, with a blue and violet reflection; this is again encompassed with two other circles, glossed with different tints of gold and copper-colour, varying into other shades, according to their position with respect to the light: the external row of feathers are not adorned with the eye-like spot, but are of an uniform dusky colour: the thighs are yellowish; the legs are gray-brown, those of the male furnished with a strong spur, nearly an inch in length.

The female is rather less than the male, and her train is very short, and destitute of those resplendent beauties that ornament that of the male, and the feathers of which it is composed are even shorter than the tail itself: her crest is shorter, and her whole plumage partakes of a cinereous hue: her throat and neck are green; and the spots on the sides of the head are larger than those of the male.

In a domestic state, the peacock varies greatly in its plumage, but all its varieties are readily distinguished, by having the wing-coverts transversely striated with black: the wings are also striated, and variegated with rufous, blackish, and green; having a ground colour, reddish-brown: the variegated peacock is only a mixed breed, between the common and the white variety, and is found in every variety and proportion of colour between the two: but the most usual appearance is, for the cheeks, throat, upper parts of the belly, and the wing-coverts, to be white.

Occasionally the peacock has the whole of the plumage of a pure white colour, the eyes of the train not excepted, but they may be traced by a different undulation of shade upon that part: like many other gallinaceous birds, the female sometimes assumes the plumage of the male, after having ceased to breed; it also obtains strong rudiments of spurs.

Without doubt the peacock is the most elegant and beautiful of the feathered creation, the splendour of its plumage, and the elegance of its form, not being exceeded by any. Its matchless plumes seem to combine all that delights the eye in the soft and delicate tints of the finest flowers, all that dazzles it in the sparkling lustre of gems, and all that astonishes it in the grand display of the rainbow: all contend to give it a place high in our esteem. However, these superb plumes are shed every year: then, as if sensible of his loss, he seeks the most obscure retreats to conceal himself, till the returning spring restores him to his accustomed beauty.

This bird has been long naturalized in Europe and America, but it is of eastern origin, having been introduced, about the time of Alexander, into Greece: in the neighbourhood of the Ganges, and the extensive plains of India, it occurs in the greatest profusion, and grows to a great size: it is a very shy bird, in its native state, and is difficult to catch, except by the following contrivance, adopted by the fowlers in the east. A kind of banner is prepared, having some lighted candles fitted upon it, and paintings of peacocks; this (during the darkness of the night) is held up in the trees upon which the birds roost; they, being dazzled by the light, or deceived by the figure, stretch out their necks repeatedly, till they become entangled in a noose, fixed for the purpose, and the fowler draws the cord and secures his victims. Tavernier asserts that in some parts they are caught by means of a kind of birdlime.

In these climates the females lay but four or five eggs at a time, but in their native state they are much more fertile: she always chooses some sequestered or secret spot to deposit them, as the male is apt to break them; they are like those of the turkey, being white and speckled. The incubation occupies from twenty-seven to thirty days, according to the temperature of the climate, or the warmth of the season. The young acquire the perfect brilliancy of plumage in their third year, but in colder climates they require great care in rearing: they feed upon meal and insects, and when they are six or seven months old, they will eat wheat and various sorts of grain, like other gallinaceous birds: they are said to be killed by eating the flowers of the elder. Aristotle affirms that they live about twenty-five years, but by Willoughby and others, they are supposed to live nearly a hundred: the former opinion appears to be most agreeable to nature.

When pleased or delighted, the male expands his gaudy train, and displays all the majesty of his beauty, stretching and turning slowly about, as if to catch every gleam of light to produce new and inconceivable hues of splendid colours. By a strong muscular vibration, he can make the shafts of his long feathers clatter in an extraordinary manner.

In this country, peacocks are unable to fly much, but they are fond of climbing, and commonly pass the night upon the roofs of houses, where they do considerable mischief, or upon the highest trees, and from these situations it is that they utter their harsh and discordant cry, which is a perfect contrast to their brilliant plumage.

During the period of the Romans, they were highly esteemed for the table, but at present, only the young are considered of any importance, as the flesh is very hard and dry. Hortensius was the first person who ordered them to be served up at his table.

FIG. 2. *Pied Peacock. Pavo cristatus V. varius*, LINN.

FIG. 3. *White Peacock. Pavo cristatus var. albus*, LINN.

These are varieties of the common peacock.

FIG. 4. *Iris Peacock. Pavo bicalaratus*, LINN.

The most remarkable circumstance relating to this bird is, that of the tarsi being armed with several spurs, which vary in number from two to six: and frequently the same bird has a different number on each leg, individuals mentioned by Temminck possessing three on one, and two on the other: these spurs are frequently joined together at their base, but it is generally either the two upper or the two lower that undergo that change. Another curious fact relating to this species is, that the tail is composed of two distinct ranges or tiers of long feathers; the lowest being the true tail: these feathers are capable of being erected when the bird is agitated, but at other times they remain in a horizontal position.

It is about the size of the painted pheasant: length twenty-three inches, of which the tail is upwards of ten: the head and the top of the neck are of a brown-gray, getting brighter on the throat: the feathers on the lower part of the neck, the breast, and the belly, are of a dull brown, with transverse undulated bands of dusky brown: the greater wing-feathers are brown, varied with an earthy gray; the rest of them, as also those of the shoulders, are of a yellowish gray, varied with small dusky brown bands; each feather possessing towards its extremity a brilliant round spot, of a green-blue colour, changing to splendid gold and purple, according to the disposition of the light, in some aspects vying with the opal; these spots are surrounded by a circle of black, and another of yellowish white, with which latter colour the tip of each feather is adorned: the back, the rump, and the upper tail-coverts, are clear brown, spotted and transversely undulated with yellowish white: the tail-feathers are dull brown, varied with small spots of yellow ochre: at one inch and a quarter from the tips of the upper range, and one and three quarters from those of the lower, are two shining spots, of an oval form, united one to the other, and separated by the shafts; the centres of these spots are green, reflecting brilliant hues of blue and purple, but not so splendid as those on the wings and back; they are surrounded by a circle of black, which is again inclosed in another of dull gray of twice the breadth of the black: the upper mandible of the beak is red at its base, and black at its tip; the under is yellow, tipped with brown: the eyes are encircled with bright gray feathers; the irides are brilliant yellow: the feet are black, as are the spurs; the claws gray.

The female has the plumage less brilliant, and the tail shorter: the feet are dull gray, and in place of the lower spur is situated a prominent callosity. The young have their plumage entirely of an earthy-gray, with large spots, and small lines of a brown colour: after the first moult, the plumage becomes less irregular, and the position of the spots on the wings and tail becomes visible; at the second, they become more determined, and possess the fine golden-blue tint, with green reflections; but it is not till after the third moult, which takes place at two years of age, that all the colours are produced in perfection.

In a natural state, this species is not very wild; it becomes readily accustomed to confinement, and propagates its species in a domestic state, with as great facility as most other gallinaceous birds. It is a native of China, and the mountains that separate Indoostan and Thibet: according to Sonnerat, it occurs likewise in Malacca.

PLATE CXLIII.—CRUSTACEA.

The genus PAGURUS, of Fabricius, is characterized by having the last four feet much shorter than the others, and the forceps are covered with granules. Naturalists have divided this genus into several others, which it is not necessary here to specify. The annexed plate illustrates three species.

FIG. 1. *Pagurus excavatus*, CUV. *Cancer excavatus*, LINN. In this species the right claw is the largest, with two excavations, and a similar one on the moveable pincer. It is parasitic, inhabiting marine shells, particularly those of Turbo and Trochus.

FIG. 2. *Pagurus canaliculatus*, CUV. *Cancer canaliculatus*, LINN. Hands and joint below grooved, with the margin elevated and serrated: the legs are hairy.

FIG. 3. *Pagurus arrosor*, CUV. *Cancer arrosor*, LINN. Thorax flat; claws with numerous transverse furrows.

In the genus GAMMARUS there are four antennæ, simple and pedunculate; the head is distinct; body small, oblong, and has many joints. Tail with many styles; legs numerous.

FIG. 4. *Gammarus ampulla*, CUV. *Cancer ampulla*, LINN. In this species the hands are without fangs, and the legs are fourteen in number. Inhabits the North Seas.

FIG. 5. *Gammarus spinosus*, CUV. *Cancer spinosus*, LINN.

FIG. 6. *Gammarus linearis*, CUV. *Cancer linearis*, LINN.

FIG. 7. *Gammarus paludosus*, FAB. *Branchipus paludosus*, CUV.

FIG. 8. *Gammarus pulex*, CUV. *Cancer pulex*, LINN.

FIG. 9. *Gammarus podurus*, CUV. *Cancer podurus*, LINN.

FIG. 10. *Gammarus mantis*, FAB. *Squilla mantis*, CUV.

PLATE CXLIV.—ICHTHYOLOGY.

The genus SCARUS, of Linnæus, has very convex, rounded jaws, which are furnished with teeth arranged like scales, upon their edge and anterior surface.

FIG. 1. *Scarus cretensis*, LINN. and CUV. A native of the Mediterranean, whence its specific name.

The genus LABRAX, of Cuvier, is distinguished from the perches by scaly opercula, terminating in two spines, and by a rough tongue.

FIG. 2. *Labrax lupus*, CUV. This species inhabits the Mediterranean, and was called *labrax* and *lupus*, by the ancients.

The genus UMBRINA, of Cuvier, is distinguished from the other Sciænæ proper, by a cirrhus under the symphysis of the lower jaw.

FIG. 3. *Umbrina cirrhosa*, CUV. *Sciæna cirrhosa*, LINN. Inhabits the Mediterranean.

FIG. 4. *Sciæna punctata*, LINN.

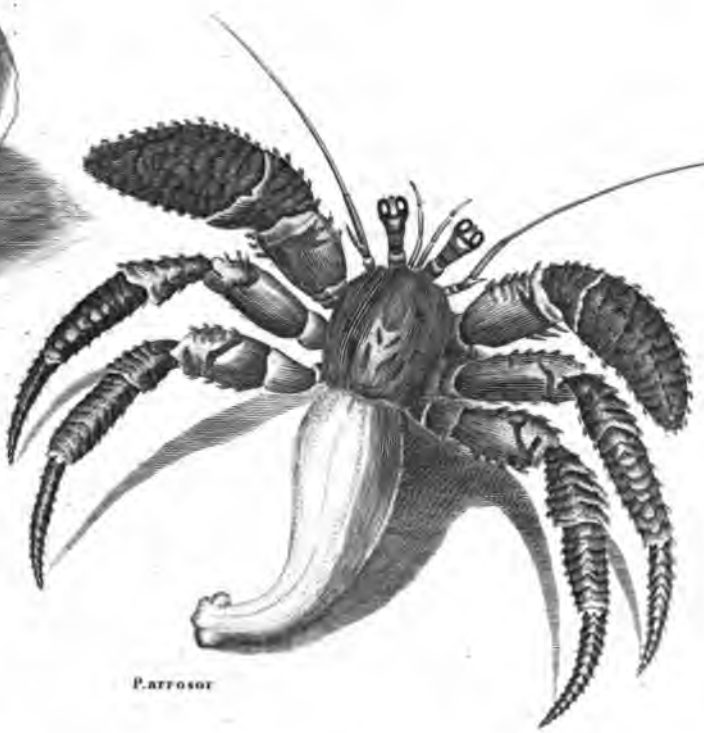
CRUSTACEA

Order CANCER.

GENUS PAGURUS – G. GAMMARUS – G. GAMMARELLUS.



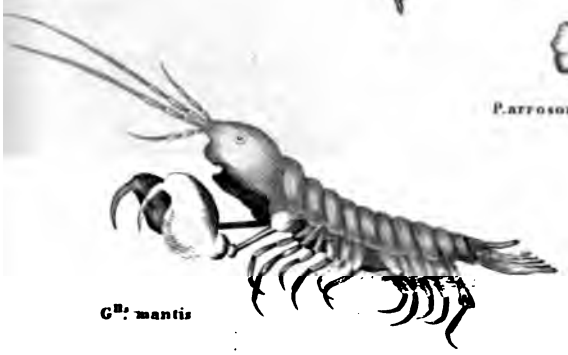
P. excavatus



P. arrosor



P. canaticulatus

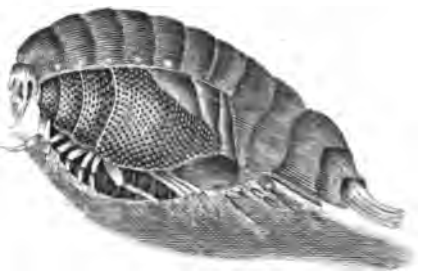


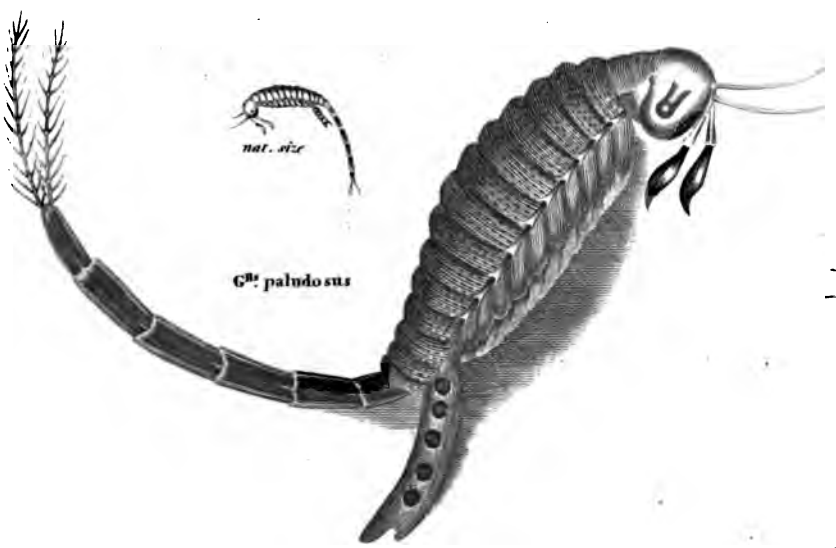
G^us. mantis



G^us. podurus

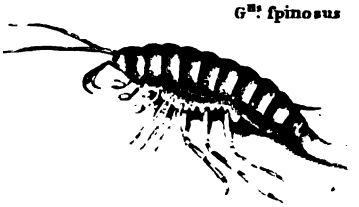
G. ampulla





G^us. paludosus

G^us. spinosus

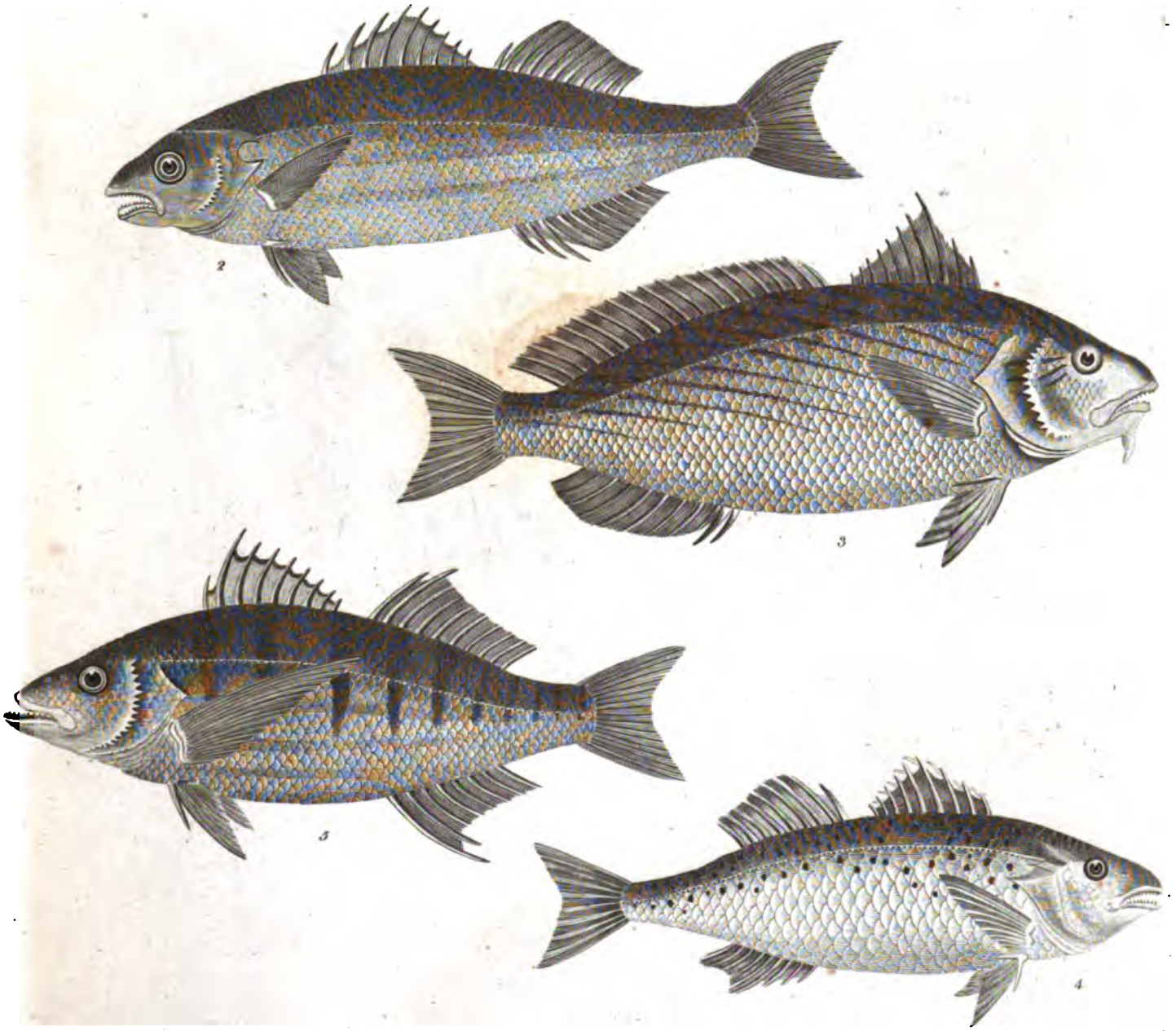


G^us. pulex *Baster.*





G^us. linearis



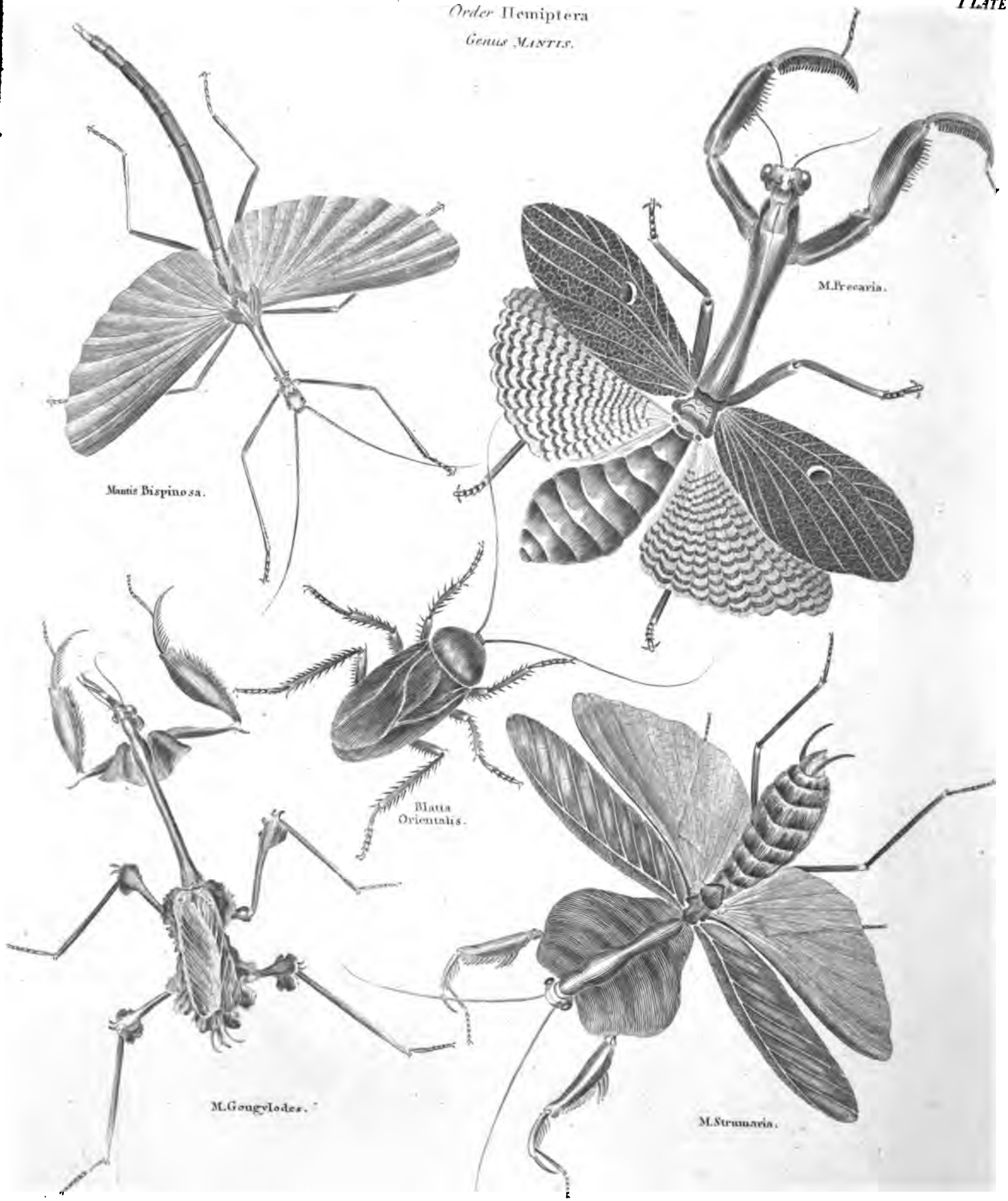
G. SCARUS 1 GENUS SCIÆNA

1. S. cretensis — 2. S. dicantha — 3. S. cirrosa — 4. S. punctata — 5. S. plumieri

ENTOMOLOGY.

Order Hemiptera

Genus MANTIS.



Genus CYNIPS - G. TENTHREDO. *G. SIREX.* *G. ICHNEUMON - G. SPHEX.*



1. C. Quercus folii
2. T. bimaculata
3. T. femorata
4. T. falcicornis
5. S. gigas
6. S. juvenca
7. S. lobata
8. I. flavicor
9. I. persua
* ma



Indica



Papalis



Papalis



Oliva

Tornatilis





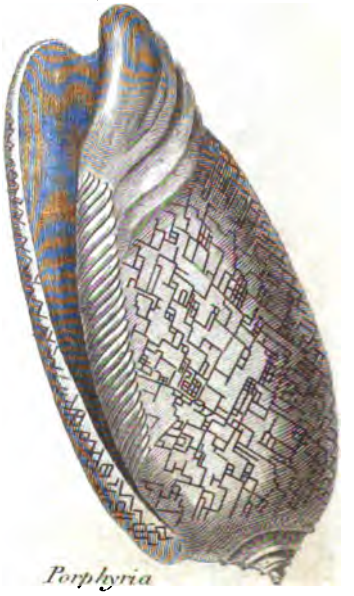
Episcopatis.

Pallida



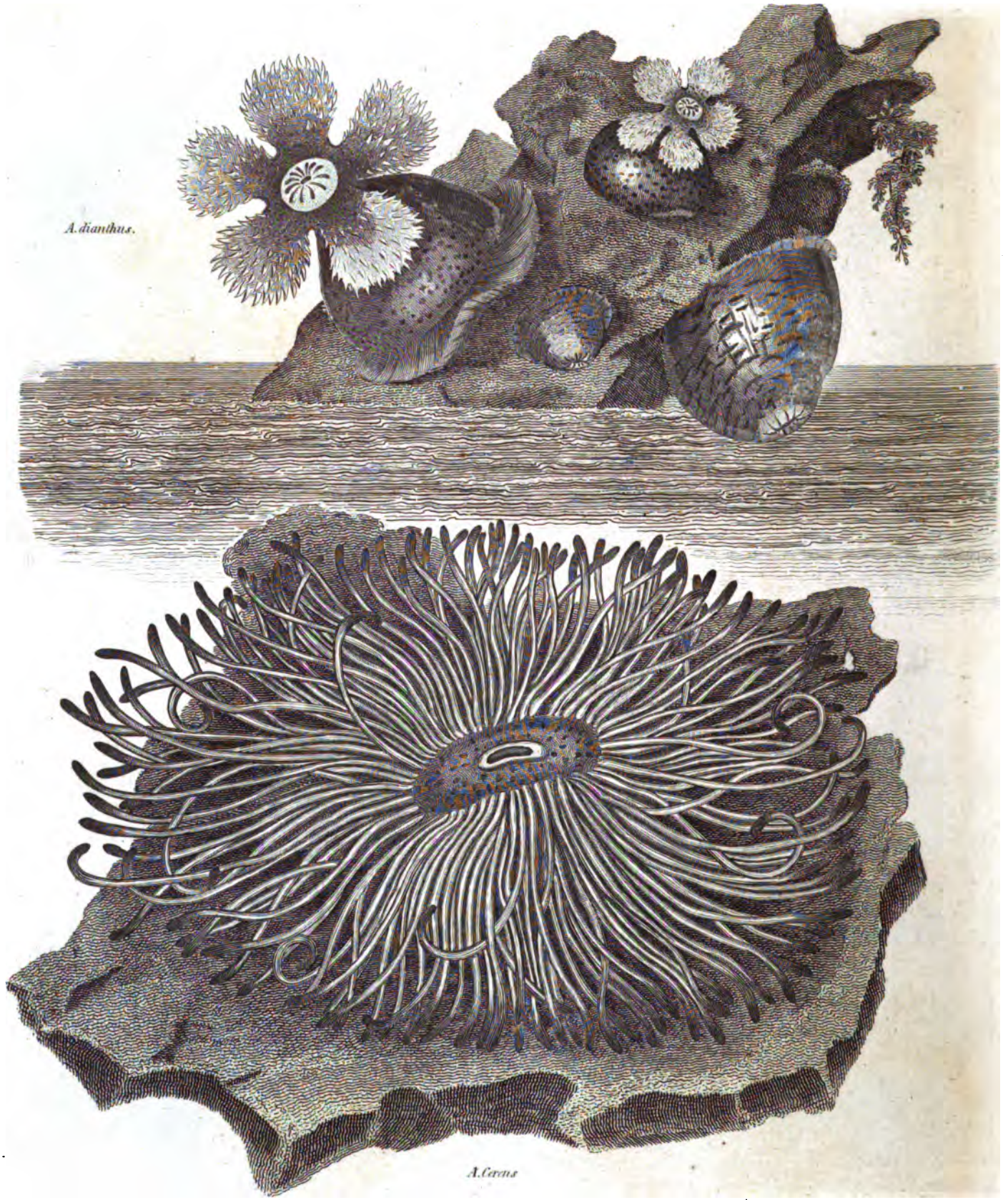


Æthiopica



Porphyria

C Tiebout Sc


A. dianthus.
A. Cereus

BASALT.

PLATE 149.





1. Hippopotamus Amphibius. Hippopotamus. 2. Tapir Americanus. Tapir.

The true *Perches* (Perca) have the preoperculum dentated, the bony operculum terminated by two or three sharp points, and a smooth tongue.

Fig. 5. *Sciena plumieri*, Linn. *Perca plumieri*, Cuv. Inhabits the seas of America.

PLATE CXLV.—ENTOMOLOGY.

Fig. 1. *Mantis precaria*, Linn. and Lat.

Fig. 2. *Mantis bispinosum*, Linn. *Spectrum bispinosum*, Lat.

Fig. 3. *Mantis strumaria*, Linn. and Lat.

Fig. 4. *Mantis gongyloides*, Linn. and Lat.

Fig. 5. *Blatta orientalis*, Linn and Lat. Cockroach.

The insects of the genus Mantis are found only in southern and temperate climates, and remain on plants and trees. They are carnivorous, and seize their prey with their fore legs. They are diurnal insects.

The genus Blatta, on the contrary, is nocturnal, and inhabits kitchens, ovens, and other domestic places. It embraces many species, which are disagreeably familiar by the name of cockroaches, or black beetles.

PLATE CXLVI.—ENTOMOLOGY.

The order Hymenoptera, of Linnæus, was instituted for the reception of those insects which have four membranous wings, the abdomen of the female being mostly armed with a sting. It embraces a vast number of very dissimilar insects, which are grouped in numerous genera.

The Hymenoptera undergo a complete metamorphosis. Most of their larvæ resemble worms, and are destitute of feet. Some feed on vegetable substances, while others devour insects. But the perfect insect lives on flowers, and their period of life, from their birth to their ultimate metamorphosis, is limited to a year.

Fig. 1. *Cynips guercus folii*, Linn. and Lat.

Fig. 2. and 2*. *Tenthredo bimaculata*, Linn.

Fig. 3. *Tenthredo femorata*, Linn. *Cimbex femoratus*, Lat.

Fig. 4. and 4*. *Tethredo falcicornis*, Linn.

Fig. 5. *Sirex gigas*, Linn. and Lat.

Fig. 6. *Sirex juvenus*, Linn. and Lat.

Fig. 7. *Sirex lobatus*, Linn. *Sphex lobatus*, Lat.

Fig. 8. *Ichneumon flavicornis*, Linn. *Ophion flavicornis*, Lat.

Fig. 9. *Ichneumon persuasorius*, Linn. *Pimpla persuasoria*, Lat.

PLATE CXLVII.—CONCHOLOGY.

The Linnæan genus Voluta embraces so many dissimilar shells, that later naturalists have subdivided it into several additional genera. The true Voluta, as defined by Lamarck, has the columella marked with large folds, the one most remote from the spine being largest.

Fig. 1. *Voluta indica, vel melo*, Linn. and Lam. Of an orange or reddish-brown colour, with blackish spots. Inhabits the seas of the Indian Archipelago.

Fig. 2. *Voluta æthiopica*, Linn. and Lam. This beautiful volute has a row of curved spines surrounding the base of the spire. It inhabits the Indian Ocean.

The genus Mitra is characterised by an oblong aperture, with a few large folds on the columella, the one nearest the spire being the largest. Its spire is mostly pointed.

Fig. 3. and 4. *Mitra papalis*, Lam. *Voluta papalis*, Linn. A beautiful species, from the Indian seas.

Fig. 5. *Mitra episcopalis*, Lam. *Voluta episcopalis*, Linn. Also from India, and highly prized by collectors.

The genus Oliva is so named from the oblong and elliptical form of its shell, the aperture of which is narrow, long, and emarginated opposite to the spire. The columella is marked with numerous striæ.

Fig. 6. *Oliva porphyria*, Lam. *Voluta porphyria*, Linn. The colours of this shell are reddish-brown and white, arranged in angular spots. It inhabits the coast of Mexico.

Fig. 7. *Voluta oliva*, Linn.

Fig. 8. *Voluta tornatilis*, Linn. This shell belongs to the genus Tornatilla, of Lamarck.

Fig. 9. *Voluta pallida*, Linn.

PLATE CXLVIII.—ZOOPHYTES.

The figures on the annexed plate represent two species of Actinia, a genus of Zoophytes of very obscure organization. The body is always cylindrical or conical, frequently without any viscus, excepting its cavity, and frequently also with a visible stomach. Most of these animals are capable of forming compound beings, by shooting out new individuals, like buds.

The actiniæ usually fix themselves by a broad and flat base to a rock. Their fleshy body is frequently ornamented with bright colours, and exhibits numerous tentaculæ, placed in several rows round the mouth, like the petals of a double flower. When they retract these tentaculæ, the opening through which those organs pass, contracts, and closes over them, like the mouth of a purse.

Fig. 1. *Actinia dianthus*, Linn. and Cuv. A conical body, with five fan-shaped tentaculæ. Inhabits the tropic seas.

Fig. 2. *Actinia cereus*, Linn. and Cuv. Tentaculæ long, numerous, and thread-like. Found adhering to rocks, in the Indian Ocean.

PLATE CXLIX.—GEOLOGY.

This plate gives a view of the mountain of *Aisa*, called *La coupe*, or the *col d'Aisa*, in the Viverrais. It affords an excellent example of the formation of basaltic columns, and illustrates the hypothesis of the Huttonian system, according to which, the basaltic matter has been originally of igneous origin, and, while in a state of fusion, cast out of the crater of the mountain. In its progress, this lava has formed a wavy channel down the side of the mountain. According to Faujas de St. Fond, this is the most remarkable and best characterized crater in the volcanic district of Viverrais. The ends of the columns may be distinctly seen before the basalt reaches the river.

PLATE CL.—QUADRUPEDS.

Order Bellue. Genus Hippopotamus. Genus Tapir, or Tapiras, of Cuvier.

Fig. 1. *Hippopotamus. Hippopotamus amphibius*, Linn.

The Hippopotamus is an animal which, from its superior size, and peculiar manner of life, appears, like the elephant, to have attracted the observation of mankind in the earliest ages. It is a native of the warmer regions of the globe, and is chiefly found in the middle parts of Africa, inhabiting large rivers, and especially such as run through countries overshadowed by large

forests; walking about at the bottom, and raising itself at intervals to the surface, for the purpose of respiration. By night it quits its watery residence, to graze in the neighbouring plains, devouring great quantities of herbage, and with its vast teeth destroying the more tender kind of trees and other vegetables. It is sometimes seen even in the sea, at some distance from the mouths of rivers; but this is supposed to be merely for the purpose of spatiating more at large, by way of exercise; for it will not even drink salt water, and does not prey on fish, or indeed live on any kind of animal food. The general size of the hippopotamus seems to be nearly equal to that of the rhinoceros, and it is sometimes even superior.* Its form is highly uncouth; the body being extremely large, fat, and round; the legs very short and thick; the head very large; the mouth extremely wide, and the teeth of vast strength and size; more particularly the tusks or canine teeth of the lower jaw, which are of a curved form, subcylindric, striated in a longitudinal direction, and obliquely truncated or cut off at their extremities: they sometimes measure more than two feet in length, and weigh upwards of six pounds each. Those in the upper jaw are much smaller. The front teeth in the upper jaw are of moderate size: those of the lower jaw are very strong, of a somewhat conical form, slightly pointed, and project forwards almost horizontally: the lips are very thick and broad, and are beset, here and there, with scattered tufts of strong, short bristles: the nostrils are rather small: the eyes small and black: the ears small, slightly pointed, and lined internally with short, soft hair: the tail is thick, short, slightly compressed, sparingly covered with hair, and marked by several strong circular wrinkles: the feet are very large, and are divided into four segments, or toes, each armed or covered with a strong, short hoof. The whole animal is covered with short hair, which is much more thinly set on the under parts than on the upper. The hippopotamus, when just emerged from the water, appears of a palish brown, or mouse-colour, with a blueish or slate-coloured cast on the upper parts; and the belly is flesh-coloured, the skin appearing through the hair. When perfectly dry, the colour is an obscure brown, without any of the blueish cast. The skin is most excessively tough and strong, except on the belly, where it is considerably softer. This animal is the *Behemoth* of the sacred writings, where it is poetically described as drinking up a river, and having bones as strong as brass, and ribs of iron. (Job, c. 40.) Its voice is a peculiar kind of interrupted roar, between that of a bull and the braying of an elephant. When on land, it moves in a somewhat slow and awkward manner, but if pursued, can run with considerable speed, and directly plunging into the water, sinks to the bottom, and pursues its progress beneath. It is observed to be extremely cautious of making its appearance by day; especially in such places as are much frequented by mankind; scarcely lifting its nose above the surface while breathing; but is fearless in rivers which run through unfrequented regions; where it is occasionally seen to rush out of the water with sudden impetuosity, trampling down everything in its way; and at such times is, of course, highly dangerous. It is, however, naturally of a harmless disposition; not attacking other animals, but merely committing havoc in plantations of maize, rice, sugar-canes, &c. and destroying the roots of trees, by loosening them with its vast teeth. It is capable, notwithstanding its great bulk, of swimming very swiftly. Sometimes hippopotami are seen going in herds, or companies, to the distance of some miles from the bank of a river, in quest of food. If wounded in the water, they become furious, and are said to attack the boats or canoes from whence the injury proceeded, and either overturn or sink them, by biting out large pieces from the bottom. The hippopotamus sleeps in the small reedy islets which are found here and there in the rivers it frequents. In such spots it also brings forth its young; having only one at a birth, which it nurses with great care for a considerable time. The young is capable of being tamed, and we are assured by Belon, that he saw one so gentle as to show no inclination to escape, or to do any kind of mischief, when let out of the stable in which it was kept.

These animals are said to be most successfully taken by preparing pitfalls for them, of large size, near the rivers. They are also occasionally shot, or killed with harpoons. Their flesh is reckoned good, by the Africans, and the fat is said to be a fine kind of lard. But it is chiefly on account of the teeth, and more particularly of the tusks, that this animal is killed; their hardness being superior to that of ivory, at the same time that they are not so subject to become yellow; for which reason, they are much used by the dentists. The skin, from its great thickness and strength, when dried, is used by the African nations for bucklers or shields, and is said to be proof against the stroke of a bullet; and, indeed, the living animal, if shot at anywhere but on the head or the belly, is scarcely vulnerable; the tough skin causing a bullet to glance from its surface.

The hippopotamus was known to the ancient Romans, and we are told by Pliny, that *Scaurus* treated the people, during his ædileship, with the sight of four crocodiles, and one hippopotamus. They were exhibited in a temporary lake, prepared for the purpose. Augustus is also said to have exhibited one, on his triumph over Cleopatra. The animal, however, was not so far noticed as to have been properly described by the ancients; neither Aristotle nor Pliny giving accurate accounts of it; nor was it till about the beginning of the seventeenth century, that it could be said to be justly described. At that period, Zerenghi, an Italian surgeon, printed at Naples, a tolerably accurate description, accompanied by a figure, from the dried skin. The same figure is also repeated in Aldrovandus, &c. It is but lately that the full history of the animal has been known, and that accurate and satisfactory representations of it have been published; and this has been chiefly owing to the laudable and zealous efforts of Dr. Sparmann, Colonel Gordon, Mr. Masson, and others, in examining the living animal in its native regions, and, by their observations, contributing to complete the descriptions of naturalists.

The largest female hippopotamus killed by Colonel Gordon, was about eleven feet long, and the largest male, which always exceeds the female in size, about eleven feet eight inches. Mr. Bruce, however, speaks of hippopotami in the lake *Tzana*, of more than twenty feet long.

The hippopotamus has only a single stomach, and does not ruminate: the stomach, however, has certain cells and divisions, analogous, in some degree, to those of the camel.

Mons. Sonnini thinks it not improbable that there may in reality exist two species of hippopotamus; one of which confines itself entirely to rivers and fresh waters, and the other to the sea.

Genus Tapir, of Linn. Tapiras, Cuv.

Generic character. The incisory teeth are $\frac{4}{4}$; the canine teeth are $\frac{1}{1}$; the grinders are $\frac{7}{7}$; total 44; the intermediate incisory teeth are shorter than the exterior; the nose is elongated, forming a small moveable proboscis, but not prehensile; the eyes are small; the ears long and moveable; the fore feet with four toes, and the hind feet with three; each toe is furnished with a short round hoof; the tail is very short, with two inguinal teats.

Fig. 2. *American Tapir. Tapir Americanus*, Linn. and Cuv.

The American tapir is about six feet in length, from the point of its proboscis to the insertion of its diminutive tail. Its colour

* Authors vary considerably in their accounts of the size of this animal. It is said that some specimens have measured seventeen feet in length, seven in height, and fifteen in circumference, the head alone measuring three feet and a half. It is added, that twelve oxen have been found necessary to draw one ashore, which had been shot in a river. Hasselquist says, the hide is a load for a camel.

QUADRUPEDS.

Linn Syst: MAMMALIA GENUS MANIS GENUS DASYPUS.



1.Manis Pentadactyla short tailed Manis._ 2.Manis Tetradactyla long tailed Manis._ 3.Dasypus Sexcinctus Six banded Armadillo.
4.Dasypus Novemcinctus Nine banded Armadillo. 5.Dasypus Duodecemcinctus Unicinctus Linn. Twelve banded Armadillo.

is of a deep brown, approaching to black, with the exception of the sides of the lower lip, a band occupying the middle of the chin beneath, the upper edges of the ears, and a naked line at the junction of the hoofs, all of which are purely white. The hair is rather thin all over the body, very short, and so closely pressed to the surface, as to be hardly perceptible at a little distance. It has a thick rounded crest, commencing between the level of the eyes, and extending to the bottom of the neck. This crest is formed internally of a powerful ligament, stretched between the spinous processes of the vertebræ of the neck, and a strong elevated ridge, occupying the line of junction between the parietal bones of the skull. This singular crest is surmounted by a thin mane of stiff black hairs.

This species passes a solitary state of existence, secluded in the impenetrable depths of mighty forests, even avoiding its own species, and keeping remote from the neighbourhood of man. It is seldom to be seen during the day, and goes abroad in quest of food in the night only: and, being one of the most omnivorous of all animals, it feeds on anything which comes in its way, having the most astonishing powers of digestion. It seems, however, to prefer wild fruits, buds, and shoots of trees. D'Azara says it is also fond of the barrero, or nitrous earth of Paraguay. Individuals have been killed, with pieces of wood, clay, small stones, and bones, in their stomachs. He kept a domesticated one, which gnawed and swallowed a silver snuff-box; and the specimens confined in menageries, have been known to devour greedily the worst of all possible filth. In a domesticated state, they eat bread, cassava, herbs, roots, fish, and flesh, either raw or roasted; rags, and, in short, anything eatable, is their indiscriminate food.

The tapir is a peaceable animal, and never attacks man or beast, unless from provocation. It is frequently hunted, on account of its flesh, which the native Indians think extremely fine; but more polished society consider it rank and disagreeable; and its hide is highly valued on account of its great thickness. Sonnini assures us, he has frequently fired at a female tapir, crossing a river with her young, with his gun heavily loaded, without giving her the least annoyance, or diverting her from the course she was pursuing, although he could distinctly see the impression of the ball on her skin. When pursued by dogs, the tapir always takes to the water, where he defends himself with great obstinacy; and, in this situation, it is impossible for dogs to overpower him, as he is standing on his feet, while they are swimming. When they approach, he seizes them in his teeth, shakes them, and frequently takes out the piece by which he held, and otherwise wounds them severely.

This animal is very fond of the water, and bathes whenever he awakes from his sleep. The range of the tapir is more extensive than that of any other animal of his size. He inhabits every part of South America, east of the great chain of the Andes, from the Straits of Magellan to the Isthmus of Darien; but is most abundant within the Tropics. His highest range, in the province of Maraquita, appears to be from three to three thousand six hundred feet above the level of the sea.

Sonnini tells us, that in Cayenne, the tapir is domesticated, and allowed to walk at liberty in the streets. The tame ones abandon their nocturnal habits, and go during the day to the neighbouring woods to feed, always returning home at night. They are fond of being noticed, and will follow their master, exhibiting various tokens of attachment.

The female produces in November, and only one at a time, in the care of which she is entirely unassisted by the male.

PLATE CLI.—QUADRUPEDS.

MAMMALIA. Genus MANIS. Genus DASYPUS.

Genus MANIS.

Generic character. Without teeth; the head small; the muzzle long; the tongue protractile; the body is elongated, and covered with strong imbricated scales or plates, and capable of being rolled up into a spherical shape; feet with five toes, formed for digging; tail long, semi-prehensile, and covered with scales.

FIG. 1. ***Short-tailed Manis. Manis pentadactyla,*** LINN. and CUV. ***Manis Crassicaudata,*** GEOFFROY.

The whole body, legs, and tail, are covered with broad, but sharp-pointed scales, which are striated throughout the whole length in the young animal, but quite smooth in the adult, the belly being the only part not protected by this secure covering. The tail appears like a continuation of the body, tapering to rather an obtuse point, and not quite so long as the body. The colour of the whole animal is pale yellowish-brown, and the surface glossy. This species is frequently found six feet in length, of which the tail is nearly four. It is said to walk slowly, and, when attacked, it rolls itself up; and in this state, it can resist the attacks of the leopard or tiger. It lives in woods, and feeds on ants, in the same manner as the ant-eater. The flesh is said to be esteemed as a great delicacy. It is a native of India and Guiana.

FIG. 2. ***Long-tailed Manis. Manis Tetradactyla,*** LINN. and CUV.

This animal, known in India by the name of the Phatagen, is of a very long and slender form: the head is small; the snout narrow: the whole body, except beneath, covered with broad, but sharp-pointed scales, which are striated throughout their whole length: the tail is more than twice the length of the body, and tapers gradually to the tip. The legs are very short; scaled like the body, and on each of the feet are four claws, of which those on the fore feet are stronger than those of the hind. The colour of the whole animal is an uniform deep brown, with a cast of yellowish, and with a glossy or polished surface. The manis tetradactyla grows to the length of five feet, measuring from the tip of the nose to the extremity of the tail.

Genus DASYPUS.

Generic character. They have either no incisory teeth, or they are placed $\frac{2}{2}$; and are without canine teeth; the grinders vary, in the several species, from 28 to 68; these are cylindrical, separate, and without enamel on the inner side; the head is large; the mouth and eyes small; the tongue partially extensible; the whole body is covered with a shell or plate of armour; the fore feet have four or five toes, with long nails fit for digging; the hind feet with five toes; the tail is rather long and round; with two or four teats; intestines without a cœcum.

FIG. 3. ***Six-banded Armadillo. Dasypus sexcinctus,*** LINN. and CUV.

Instead of hair, the bodies of this remarkable tribe of animals are covered with a kind of coat of mail, divided into bands or shelly zones; and, in this respect, they seem an intermediate link between quadrupeds and tortoises. Armadillos afford a beautiful example of deviation, in general structure and appearance, from the quadrupedal form. They inhabit subterraneous retreats or burrows, which they excavate with facility, by means of their large and strong claws. They feed at night, on roots and grain, and occasionally prey on the smaller animals of various kinds, such as worms, insects, and lizards. In a captive state, they feed on flesh readily, which they will eat in considerable quantity.

The flesh of the armadillo is considered excellent eating, by the natives of South America, especially when young; but when old, it acquires a strong musky flavour. When attacked, the armadillo rolls itself up in the form of a round ball, and becomes, in a degree, invulnerable. The mechanism of their singular structure demands our highest admiration, and affords a striking example of the powers of divine wisdom.

Fig. 4. *Nine-banded Armadillo. Dasypus novemcinctus*, Linn. and Cuv.

The number of bands or zones in this species is generally nine: they are extremely distinct or well defined, and are transversely marked by very numerous wedge-shaped or acutely-triangular figures, alternating with smaller opposite ones: the head is smaller, longer in proportion, and sharper snouted than in any other species: the fore and hind parts of the shield or covering, are marked by very numerous flat, rounded scales or tubercles, with smaller ones interposed: the ears are moderately large, and upright; the tail is longer than in any other species, and tapers gradually to the tip. It is marked by transverse rows of longish hexagonal divisions on each joint: on the fore feet are four toes, and five on the hind: the claws moderately large and strong.

Though this species preseryes, in general, its specific character of *nine bands*, yet this is not always to be depended on, since specimens sometimes occur in which only *eight* bands are visible. A specimen of this kind occurs in the British Museum; and the Count de Buffon assures us, that he has observed two specimens with eight bands only, which in every other respect perfectly resembled the nine-banded ones. He is, therefore, of opinion (and in this we clearly agree with him), that the number of bands, in this species, constitutes not a specific, but a sexual difference: the eight-banded one he supposes to be the male. The general colour of this species is a palish iron-gray; but specimens often occur in museums, of a yellowish-brown cast, having probably lost a part of their original tinge. The scales on the anterior and hinder parts are also sometimes of an angular form, instead of round.

The young specimens of this animal also exhibit a difference as to the pattern or marking of the bands; which, instead of the triangular or wedge-shaped marks before described, have a simple series of long-oval marks throughout each band; and the ultimate bands are not so distinctly defined as in the adult animal.

The *Seven-banded Armadillo, Dasypus septemcinctus*, of Linnæus and others, as before observed, is not a distinct species, but a mere variety of this; as is also the *Eight-banded Armadillo, Dasypus octocinctus*. Linn. Syst. Nat. Gmel.

Fig. 5. *Twelve-banded Armadillo. Dasypus (duodecemcinctus) unicinctus*, Linn. and Cuv.

The Twelve-banded Armadillo, according to the character generally given in authors, should have twelve zones or bands; but it is certain that this number is not very accurately observed by nature: and perhaps thirteen or fourteen is the more general number. The individuals also appear to vary in some other particulars. That described by the Count de Buffon and Mr. Pennant, under the title of the Twelve-banded Armadillo, has broad upright ears; the head is thick and broad, and is marked above into large angular divisions; the crust on the shoulders into oblong pieces, inclining to a squarish form: that on the rump into hexagonal ones; (the Count de Buffon describes them as square, though hexagonal in the figure): the fore feet have five toes, with very large and strong claws: the hind feet have the same number, but smaller: the tail is somewhat shorter than the body; and is said by Buffon to have no crustaceous* covering; differing, in that respect, from every other species: his figure represents it covered with roundish tubercles. The length of this animal, from the nose to the tail, is about a foot; the tail about seven inches, or less.

* By this, however, we are by no means to understand that the tail is merely covered by skin; on the contrary, it is guarded by scaly tubercles, which secure it almost as strongly as the armour on that of other species; and, indeed, the chief difference is, that these strong tubercles are not, strictly speaking, set in jointed rings, but scattered.

GREATER TWELVE-BANDED ARMADILLO.

This, which is by far the largest of all the armadillos, differs from the former in the pattern of the shield on the interior and hinder part of the body; all the divisions consisting of oblong squares: the tail also differs, being longer than the body. The measures of the specimen described and figured by Buffon, are thus given, viz: from nose to tail two feet ten inches, and the tail about one foot eight inches. This, Mr. Pennant says, is the largest he ever heard of: in the British Museum, however, is a specimen of exactly similar dimensions, and which is accurately represented by Shaw. The head is rather small than large; and the snout is sharpish: the ears small and sharp: the claws excessively large and strong. The bands, which are thirteen in number, are scarce distinguishable from the rest of the armour, which, both before and behind, is marked out into narrow zones, divided into numerous oblong squares: these bands on the fore part of the animal are narrower or more closely set than on the hind part, and the whole exactly agrees with Buffon's figure entitled Autre Kabassou (vol. 10. pl. 41.) The colour of the whole animal is a pale yellowish gray.

PLATE CLII.—ORNITHOLOGY.

Order Grallæ. Genus Vaginalis. Genus Parra. Genus Rallus. Genus Psophia.

Genus Vaginalis.

One species only is known of this extraordinary genus, and of its manners but little has been hitherto observed. It may be observed, that the remarkable appendage to its beak is placed at its base, and covers the nostrils, except on the fore part, and descends so low on each side of the beak as to hang over part of the under mandible; it is moveable, and may be raised upwards, or depressed so as to lay flat on the beak itself. The tongue is also singular, being round above, flat beneath, and pointed at the end. The legs are very stout and short, resembling those of the Gallinaceæ: the toes are edged with a thick membrane; the hinder one is elevated from the ground; and the claws are channelled beneath.

Fig. 1. *White Sheathbill. Vaginalis alba*, Linn.

Varies in length from fifteen to eighteen inches: its beak is black at its base; its appendage or sheath yellowish and moveable: the papillæ or warts, on the face, extend from the base of the beak beyond the eyes, which they surround; they are of a pale orange-colour, except a larger one over the eye, which is brown or blackish: the entire plumage is of a beautiful snowy-white: knob at the bend of the wings blackish: legs bare a short distance above the knees, and generally of a reddish colour (sometimes brown, white, or pale blue): claws black. The young birds want the papillæ round the eyes, or have them very indistinct.

This very singular and remarkable bird inhabits New Zealand, Kerguelen's Land, Staaten Land, and other parts of the southern hemisphere, frequenting the sea shores in flocks, feeding on mollusca and carrion, which latter makes their flesh highly offensive, though some persons pronounce it to be equal in flavour to that of the duck; while others could not venture to taste it, on account of its abominably offensive smell, even when pressed by hunger.

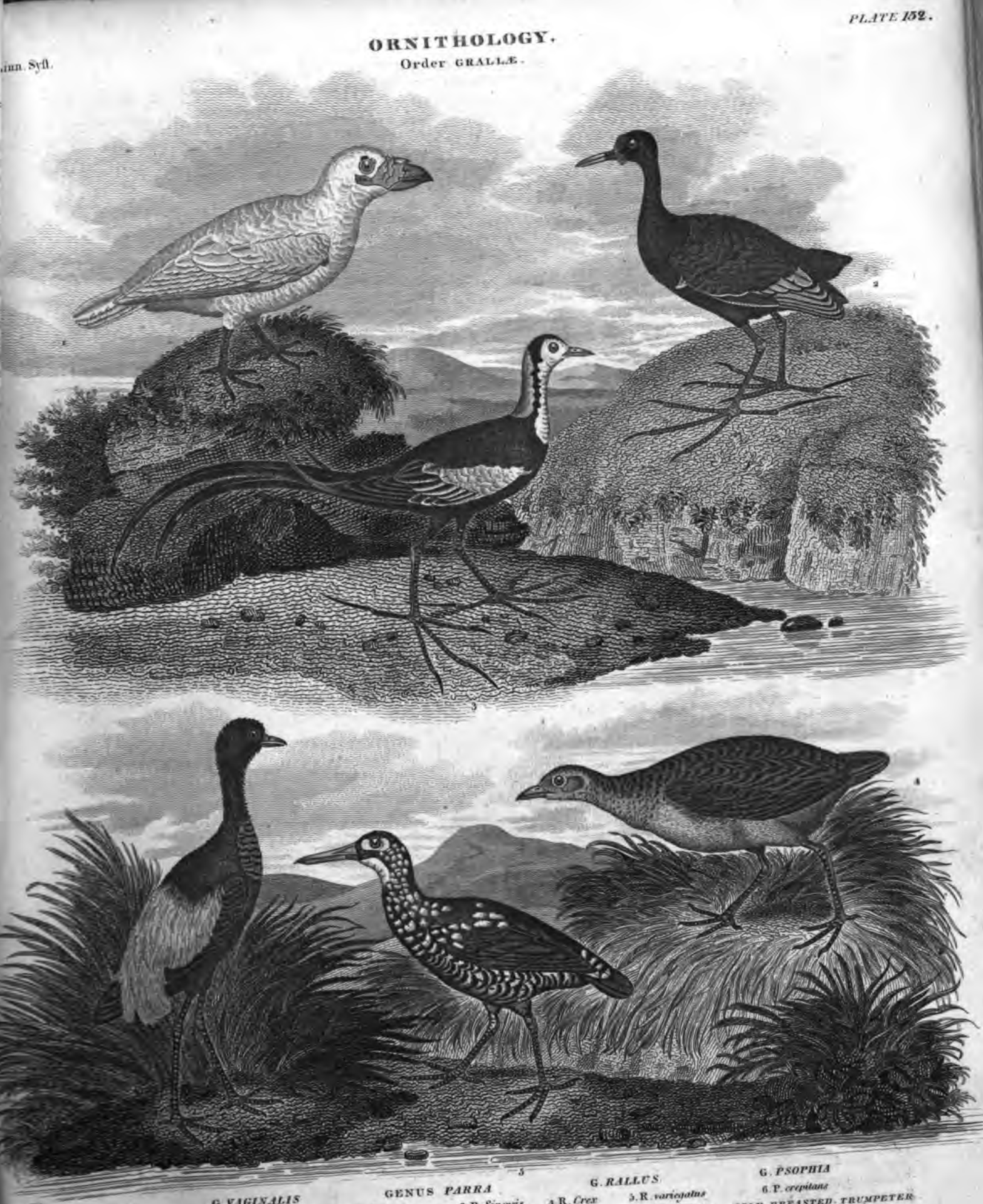
It was discovered during the voyage of the celebrated circumnavigator Cook.

Genus Parra. Jacana.

This genus is distinguished from the rest of the Waders, by the extraordinary length of the toes and claws, which in some of the species are so extremely long, as to incommode the individuals when walking. The chief use of this singular con-

ORNITHOLOGY.

Order GRALLÆ.



G. VAGINALIS
1. V. alba
WHITE SHEATH BILL

GENUS PARRA
2. P. Jacana
CHESNUT JACANA

3. P. Sinensis
CHINA J.

G. RALLUS
4. R. Crex
LAND RAIL

5. R. variegatus
VARIEGATED R.

G. PSOPHIA
6. P. crepitans
GOLD BREASTED TRUMPETER

formation, appears to be that of enabling the birds to procure their sustenance (which consists of worms, small fishes, and aquatic insects) in the marshes, as their length allows them to walk upon the surface of the plants which grow in those situations, with the greatest facility. They are noisy and quarrelsome birds.

FIG. 2. *Chestnut Jacana. Parra Jacana*, LINN.

Length nearly ten inches: beak upwards of an inch long, and orange-coloured: the head, throat, neck, breast, and the rest of the under parts are black: the back, wing-coverts, and scapulars, bright chestnut: spur on the wing yellow, and a quarter of an inch in length: the bend of the wing varied with black: the quills olive-yellow, tipped and partly edged with dusky; the outer quill margined throughout its length: tail rounded, chestnut, tipped with black; the two middle feathers varied with brown: legs greenish-ash. The young or Variable Jacana, of Latham, is thus distinguished: its beak is orange-yellow: crown of the head brown, with darker spots: the hind part of the neck the same, but deeper in colour: above the eye a white stripe, passing down on each side of the neck, and accompanied by a black one, which varies at the base of the beak, and passes through the eye: sides of the head, throat, fore part of the neck, breast, belly, thighs, and under tail-coverts white; the sides of the belly and base of the thighs being slightly sprinkled with reddish spots: wing-spur yellow: scapulars pale brown: lesser wing-coverts purplish-chestnut; the middle ones brown; the greater black: the four inner quills are brown, the rest green, margined with black at their ends, and the outer one entirely so on its exterior web: legs blueish-ash.

Inhabits Brazil, Surinam, St. Domingo, and other parts of South America and the West Indies; frequenting marshy places, sides of ponds, &c., generally in pairs, and wade in the water in search of food: they are very shy and noisy, their note very shrill, and may be heard at a great distance.

FIG. 3. *China Jacana. Parra Sinensis*, LINN.

A very pretty species; and the adult bird is thus commemorated by Latham: "Size of the gold pheasant: length two feet: beak blueish: front of the head, cheeks, fore part and sides of the neck white; hind part of the head black, descending in a line on each side of the neck to the breast: the back part of the neck, behind this, of a yellow buff-colour: between the neck and back gilded brown: all the under parts, from the breast, deep purple: back and scapulars reddish-brown: wing-coverts white: quills brown; the secondaries edged with white; the ends of some of the primaries grow very narrow towards the tips, and end almost in a point; at the bend of the wing a short, sharp, horn-coloured spur: the (four) middle tail-feathers half the length of the bird, and shaped like those of the gold pheasant: (two) of them longer than the others, ending in a point; the adjoining one (on each side) less sharp at the end, and marked, near the tip, with an oval spot of white: legs green."

The young bird is also described, by the same celebrated author, by the name of the Luzonian Jacana, from the Voyage of Sonnerat, as follows: "Beak of a grayish colour, straight, and a little enlarged at the end: top of the head deep brown: over the eye a stripe of white passing down on each side of the neck, and changing into pale yellow behind the eye: through the eye another stripe of an ash-colour accompanies the first quite down to the wing: the back is brown: the under parts, from the chin to the vent, white, except a large spot of brown on the breast: at the end of the wing is a sharp spur: the lesser wing-coverts are white, the others pale brown, transversely barred with black; the second quills white; the prime ones black; from the three last of these arise three naked shafts, two inches long, and ending in a lance-shaped feathered point; they spring from the middle of the feather to which they belong, the shaft appearing as divided, or branching into two, at that part: the toes and claws are very long, and of a dusky black.

Inhabits China, India, Java, and the adjacent countries and islands; frequenting the low marshy borders of the sea and rivers.

Genus RALLUS. Rail.

The chief distinction between the Rails and the Crakes consists in the comparative length of the beak, that part being, in the former genus larger than the head, and in the latter shorter. From the Crakes they differ in their more robust form of body, as well as their shorter wings and legs, which afford good characters of discrimination. Their manners are somewhat similar and their food consists of insects and vegetables.

FIG. 4. *Land-Rail*, or *Crake. Rallus Crex*, LINN.

Between nine and ten inches in length: its beak is light brown: irides hazel: a streak of pale ash-colour extends over each eye, from the beak to the side of the neck: all the feathers on the upper parts of the plumage are of a dark brown, edged with pale ferruginous: the wing-coverts and quills are deep chestnut: the fore parts of the neck and breast are pale cinereous: the belly is yellowish white: the sides, thighs, and vent, are faintly marked with rusty-coloured streaks: the legs are pale flesh-colour.

This species affects woody places, and high herbage or corn-fields, in the vicinity of water, or in marshy places, where it breeds, making a nest of a few dry plants carelessly put together, and lays ten or twelve eggs, of a dull white, marked with rust-coloured spots. It is much sought after, for the delicacy of its flesh; but it is a difficult bird to spring, hiding itself amongst the thickest part of the herbage, and running so nimbly through it that it is difficult to come near: it seldom springs but when driven to extremity, and generally flies low, with its legs hanging down. It is a migrative species, appearing in England about the end of April, and departing in October: on its first appearance, the male is frequently heard to utter its singular cry, which resembles the words *Crĕk-crĕk-crĕk*, rapidly repeated, and has been compared to the noise made by drawing a finger along the teeth of a comb. At this time, the bird is extremely lean, scarcely weighing six ounces; but before its departure, it becomes excessively fat, and exceeds eight ounces in weight. Its food is chiefly worms, snails, and insects, and occasionally seeds and various vegetables.

It is found in most parts of Europe, but is more plentiful in some years than in others.

FIG. 5. *Variegated Rail. Rallus variegatus*, LINN.

Inhabits Cayenne: its length is eleven inches: its beak is yellowish: the back part of the head dusky: the rest of the head, neck, and body, are irregularly spotted with black and white, the sides of the latter being streaked transversely, as in the common rail: the wing-coverts are brown, dashed with white: the wings brown: chin white: tail dusky, some of the middle feathers edged with white: legs yellow.

Genus PSOPHIA.

FIG. 6. *Gold-breasted Trumpeter. Psophia crepitans*, LINN.

In length about twenty-two inches; and its legs are five inches high, and completely covered with small scales, which reach two inches above the knee: the prevailing colour of its plumage is black: the feathers of the head and neck are very short and downy: those of the fore part of the neck and upper part of the breast are of a splendid glossy golden-green, with a reflection of blue, in some lights: those between the shoulders are rust-coloured, changing to a pale ash-colour as they proceed downwards: they are all loose and silky: the scapulary feathers are very long, and those of the tail are short, and

are twelve in number: the legs are greenish: the beak is yellowish-green.

This bird inhabits the arid mountains and upland forests of South America; never visiting the cleared grounds, nor the settlements: it associates in numerous flocks: it walks and runs, rather than flies, since it never rises more than a few feet from the ground, and then only to reach some short distance, or to gain some lower branches: it feeds on wild fruits, and when surprised in its haunts, makes its escape by the swiftness of its feet, at the same time emitting a shrill cry, not unlike that of a turkey.

The most characteristic and remarkable property of these birds consists in the wonderful noise which they often make, either of their own accord, or when urged by their keepers. This noise, which somewhat resembles the moan of pigeons, is at times preceded by a savage cry, interrupted by a sound approaching that of *sherk, sherk:* in this way the bird utters five, six, or seven times, with precipitation, a hollow voice, emitted from within its body, nearly as if one pronounced *tou, tou, tou, tou, tou, tou,* with the mouth shut, resting upon the last *tou*—a very long time. It also much resembles the lengthened doleful noise which the Dutch bakers make by blowing a glass trumpet, to inform their customers when the bread comes out of their ovens. This odd sort of noise is probably owing to the extent of the bird's lungs, and the capacity of their membranaceous cells.

This bird is easily tamed, and becomes attached to its benefactor, which it distinguishes with marks of affection. Vosmaer having reared one, says—"When he opened the cage in the morning, the kind animal hopped round him, expanding his wings and trumpeting, as if to wish him good morning: it showed equal attention when he went out and returned: no sooner did it perceive him at a distance, than it ran to meet him; and even when he happened to be in a boat, and set his foot on shore, it welcomed him with the same compliments, which it reserved for him alone, and never bestowed upon others."

PLATE CLIII.—ORNITHOLOGY.

Order Passeres. Genus Alauda. Genus Sturnus. Genus Caprimulgus.

Genus Alauda. Lark.

Larks are distinguished from all other birds by the superior length of their hinder claws, which, in some of the species, are upwards of an inch in length, and totally incapacitates them from perching on trees; consequently, they rest on the ground, where they all place their nests: some few, that have shorter claws, perch upon trees, but only on the larger branches. From the situation of their nests they are greatly exposed to the attacks of predaceous animals of the weazel kind, &c., which destroy great numbers of the eggs and young: the cuckow also frequently deposits its eggs in them.

These are the only birds that sing during flight, and there are few persons that have heard their song, but must have admired the various modulations of their melodious strains, which may be heard when the performers are invisible from the great height to which they soar. Their usual food consists of insects and their larvæ; they will also eat seeds, and in a state of confinement, will eat bread, eggs, &c.

Fig. 1. *Cape Lark. Alauda capensis*, Linn. and Cuv.

La Cravate jaune, of Buffon, is found at the Cape of Good Hope: it is eight inches in length: its beak is yellowish horn-colour: the upper parts of the plumage are brown, with the shafts of the feathers darkest: over the eye is a streak of yellow, and one of brown beneath, passing to the ear: the chin and throat are orange; the rest of the under parts yellowish white: the four outer tail-feathers are tipped with white: the legs are dusky; the hind claws slightly bent: the male has the yellow on the throat bordered with black, and the stripe above the eye deep yellow: the breast varied with brown, gray, and pale yellow, and the belly and sides reddish yellow: the female sometimes has the breast spotted with brown.

Fig. 2. *Magellanic Starling. Sturnus militaris*, Linn.

Length eight inches and a half: its beak is dusky: the upper parts of its plumage are brown, the edges of the feathers being palest: between the beak and eye a spot of crimson: the sides of the neck are black: behind the eye is a white streak, and at the base of the under mandible is a spot of that colour: the chin, fore part of the neck, breast, bend of the wings, and upper part of the belly, deep crimson: the sides of the body and thighs are black, the feathers bordered with cinereous: the vent, under tail-coverts, and tail, black; the latter slightly forked: legs brown: some specimens have a white line beginning at the nostrils and terminating on the hind head, but such have not the spot at the base of the under mandible; they may be immature birds. Native of the Falkland Islands: supposed to feed on insects.

Fig. 3. *Wattled Starling. Sturnus carunculatus*, Linn. *Philedon carunculata*, Cuv.

These most curious birds are described by Dr. Latham in the following manner. "Size of our starling: length nearly ten inches: the beak rather long and somewhat bent; it is sharp at the tip, but a trifle flatted; the colour is black, tinged with blue towards the base: irides dull hazel: from the angle of the lower mandible springs a carunculated orange-coloured membrane, tending downwards like the wattle of a cock; this is about a quarter of an inch in size: the general colour of the plumage is dull black, but the back and wing-coverts are ferruginous: the legs are black. The female is wholly of a dull ferruginous brown: the bill and legs are the same as in the male, but the wattle is not so large, nor is it very conspicuous, except in old birds. This species is found in New Zealand, particularly in the southern island, where it is pretty common: it has a weak piping voice, not worthy being called a song."

Genus Caprimulgus. Goatsucker.

The birds of this genus are readily distinguished by their immense wide gape, which in many of the species reaches beyond the eyes: they do not build a nest, but lay their eggs, which are generally two in number, on the bare ground; neither are they ever seen in society, but appear to be all of a solitary disposition: their food consists of large insects, which their wide mouth is well calculated to entrap, and most of them take their prey flying: there is but one species found on the European continent, and the greater part of them are natives of America.

Fig. 4. *Grand Goatsucker. Caprimulgus grandis*, Linn. and Cuv.

There was a magnificent specimen of this bird in the late Leverian museum, which came from Cayenne: it is described as the size of a small buzzard, its length being nearly two feet: beak covered with hairs to the tip: gape about three inches wide: upper parts of the plumage cream-colour, dotted with brown; and the shafts of the feathers the same: inner parts of the scapulars whitish: wings very long, reaching almost to the end of the tail, which is nearly half the length of the bird, and rounded at the end: quills deep brown, banded with white on each web, and with their shafts black: under parts of the body cream-colour; the breast sometimes brownish: tail brown, with whitish bars: legs brown, covered with feathers to the toes: middle claw not serrated. This species frequents hollow decayed trees that grow near the water, and only appears of an evening.

Order PASSERES



GENUS *ALAUDA* (Lark)

1.A.*Capensis* CAPE L.

G. *STURNUS* (Starling)

2.S.*Militaris* MAGELLANIC S.

3.S.*Carunculatus* WATTLED S.

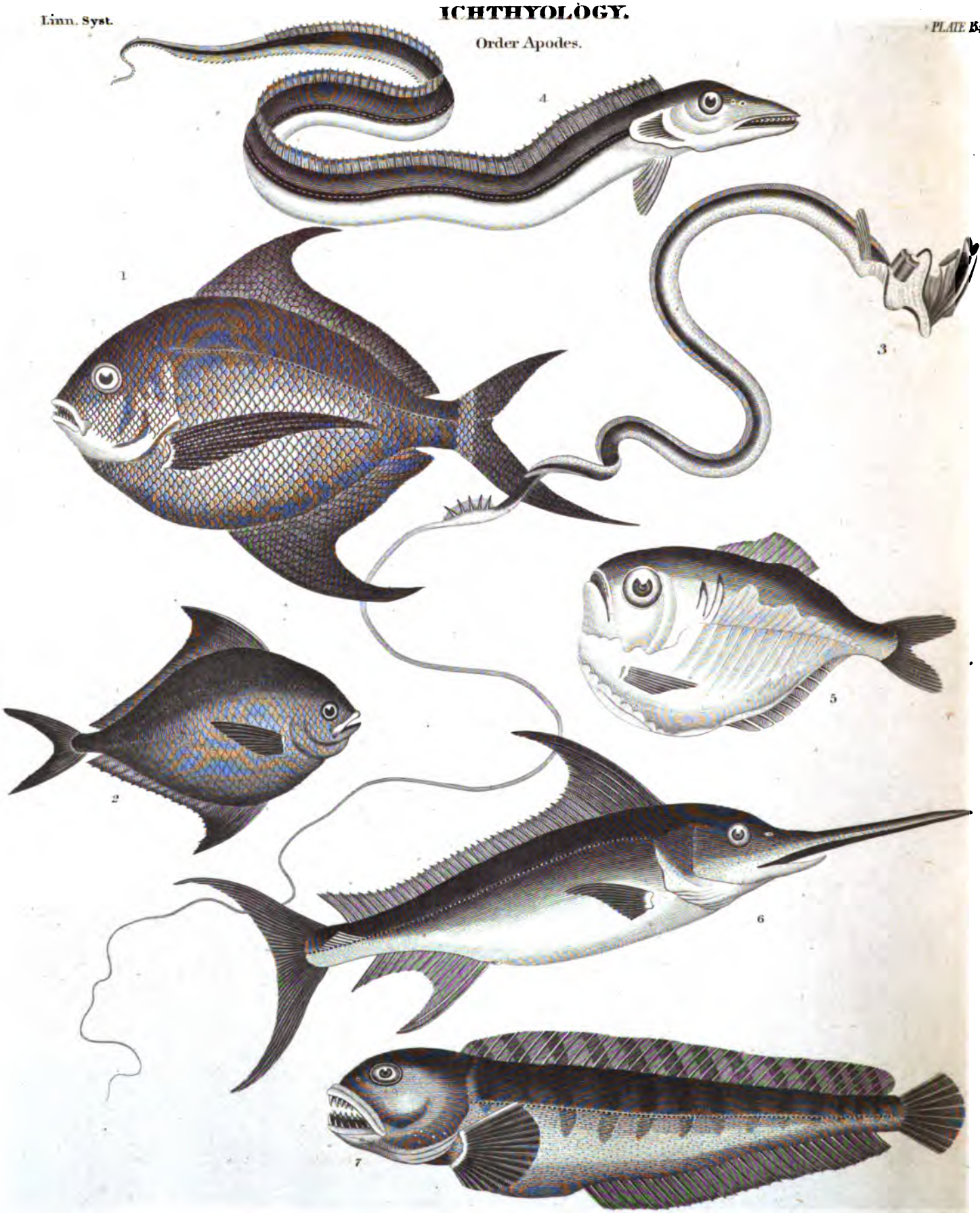
G. *CAPRIMULGUS* (Goatsucker)

4.C.*Grandis* GRAND G.

5.C.*Longipennis* LEONA G.

J. Neagle Sc

Order Apodes.

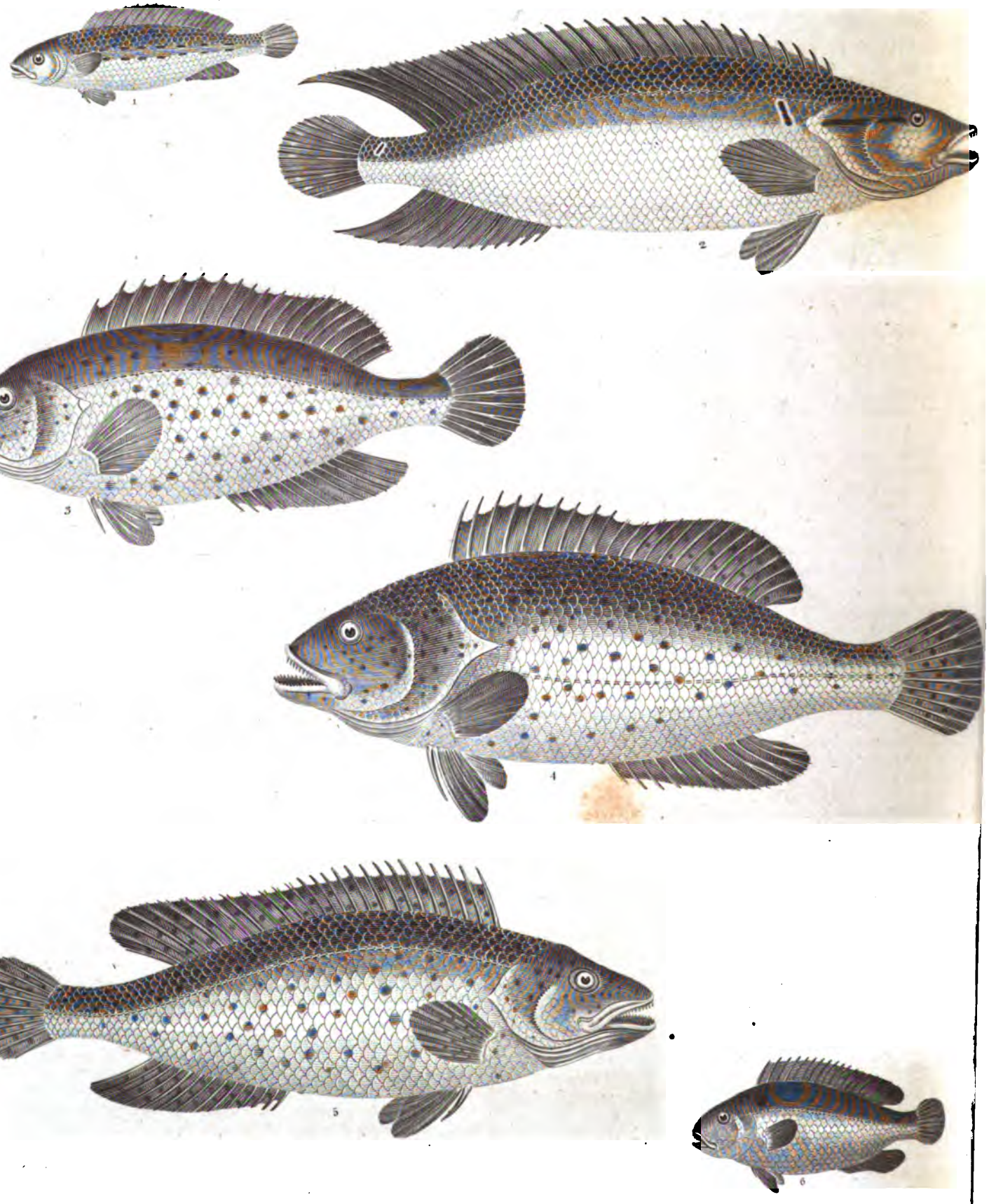


GENUS. *STROMATEUS* G. *STYLEPHORUS* G. *TRICHIURUS* G. *STERNOPTYX* G. *XIPHIAS* G. *ANARRHICAS*

1. Ste. *cinereus* 3. Sty. *chordatus* 4. T. *argenteus* 5. Ste. *diaphana* 6 X. *gladius* (Sword Fish) 7. A. *lupus* (Wolf Fish)

2. — *niger*

G.M.



GENUS PERCA.

Perch

1 P. Brasiliensis 2 P. saxatilis 3 P. punctata 4 P. guttata 5 P. maculata 6 P. bimaculata.

Engraved for C. Hamilton.

Fig. 5. *Leona Goatsucker. Caprimulgus longipennis*, Linn. and Cuv.

Has a single feather springing out of the middle part of the wing-coverts on each side, which is in length about twenty inches: it is only webbed at the tip for about five inches of its length; this part is very similar to the rest of the plumage in colour, and is crossed with five dusky bars: the web on the inside is more than one inch in breadth, but on the outside not more than one quarter of an inch: the rest of the feather towards the base for about fourteen inches, has only a few solitary hairs towards the tip on the inside: the legs are very small. Inhabits Sierra Leona.

PLATE CLIV.—ICHTHYOLOGY.

The annexed plate gives views of six remarkable genera of the Linnæan order Apodes, respecting each of which we shall offer a few remarks.

In the genus Stromateus the fish is compressed; the scales are obscure, and covered by a satin-like epidermis. It has teeth in both jaws and palate, and its tail is forked.

Fig. 1. *Stromateus cinereus*, Cuv. This species is ash-coloured. It is a native of the Indian Seas, growing about a foot in length. It is much esteemed for the table, and bears the common name of *Pampel.*

Fig. 2. *Stromateus niger*, Cuv. This fish is entirely black, and, like the former, is an inhabitant of the Indian Seas, but is little thought of as food.

The genus Stylephorus has pedunculated eyes, standing on a short, thick cylinder: the snout is lengthened and directed upwards: the body is very long and compressed, and its mouth has no teeth.

Fig. 3. *Stylephorus chordatus*, Cuv. This is a most extraordinary fish: the rostrum, or narrow part which is terminated by the mouth, is connected to the back part of the head by a flexible, leathery duplicature, which can be erected or depressed at pleasure. The body is extremely long, and greatly compressed, and gradually diminishes as it approaches the tail, which is terminated by a process or string of enormous length. It is a native of the West Indian seas: the specimen figured, was taken between Cuba and Martinique, near a small cluster of islands.

In the genus Trichiurus the head is extended, with lateral opercula, or gill-covers; the teeth are ensiform; the body is compressed, and the tail subulate and without a fin.

Fig. 4. *Trichiurus argenteus, vel lepturus*, Cuv. This species is two or three feet long, voracious, and, in pursuit of its prey, will sometimes leap out of water. It inhabits the rivers and larger lakes of South America.

The genus Sternoptyx is characterized by an obtuse head, very minute teeth, and no gill membrane: the body is compressed, without apparent scales, and the breast is carinate and folded.

Fig. 5. *Sternoptyx diaphana*, Cuv. This species is found in the American seas: it is small, compressed, truncated before, narrowed and silvery behind.

The genus Xiphias, or Sword-Fish, is distinguished by a long sword-like tusk, which terminates the upper jaw, a powerful weapon, with which they attack the largest sea animals. Their branchiæ are not pectinated. They swim with great swiftness, and their flesh is excellent.

Fig. 6. *Xiphias gladius*, Cuv. The Sword-Fish. It is one of the largest and best fishes of the European seas, frequently growing fifteen feet in length. It is more common in the Mediterranean than in the Atlantic Ocean. A parasitic crustaceous animal sometimes penetrates into its flesh, the irritation of which, has been known to cause it to dash itself on shore.

The genus Anarrhicas is marked as follows: the dorsal fin is composed of simple rays, commences at the nape of the neck, and extends to the tail. The whole body is smooth and slimy. The palate is armed with stout, bony tubercles, surmounted by small enamelled teeth. They are ferocious and dangerous.

Fig. 7. *Anarrhicas lupus*, Cuv. The Sea-Wolf. This is the most common species. It inhabits the northern seas of Europe, growing to a length of six or seven feet. It is valuable to the Icelanders, who salt and dry the flesh for food, employ the skin as shagreen, and the gall as soap.

PLATE CLV.—ICHTHYOLOGY.

The genus Perca (Perch) embraces a great number of species, many of which are familiar to anglers. The *Perca fluviatilis*, or common perch of Europe, was well known to the ancients, and especially to the luxurious Romans. Gmelin, in his last edition of Linnæus, enumerates nearly sixty species of Perca; but the genus has more recently been greatly subdivided by Cuvier, and other naturalists. The annexed plate gives beautiful and accurate views of six species.

Fig. 1. *Perca Brasiliensis*, Linn. and Cuv. Brazilian Perch. A small species, with a double row of oblong spots on each side. It inhabits the rivers of Brazil.

Fig. 2. *Perca saxatilis*, Linn. and Cuv.

Fig. 3. *Perca punctata*, Linn. *Serranus punctatus*, Cuv. In this species the body is dotted with blue spots. It inhabits the rivers of America.

Fig. 4. *Perca guttata*, Linn. *Serranus guttatus*, Cuv. The body of this species is sprinkled with spots of a blood-red colour. It inhabits the rivers of America.

Fig. 5. *Perca maculata*, Linn.

Fig. 6. *Perca bimaculata*, Linn. This is a small fish, with two spots on each side, (whence its name,) one being near the tail, and the other above and behind the gills.

The following remarks are extracted from a work recently published in Boston, to which it affords us pleasure to accord our testimony of its value. It is entitled "Natural History of the Fishes of Massachusetts: by Jerome V. C. Smith, M. D."

Perhaps there is not another fish, with the exception of the eel, so universally spread over the globe, as the fresh-water perch. It is delicate food, and therefore exceedingly valued. From the largest rivers, above the influence of tides, to the smallest rills, which trickle down the sides of the lofty mountain, the perch is always to be found. They swim swiftly, keeping near the surface, feeding on flies and minute insects. In the lake of Geneva a female was caught, from which 992,000 ova were taken. This fact shows very clearly that it is marvellously prolific, yet not ten in a hundred of the ova arrive at maturity, being the food of others. To the Greeks and Romans this fish was perfectly familiar.

Common Perch,—*Perca fluviatilis.* A beautiful fish, this, having an olive-brown tinge, intermingled with a golden hue,—together with dark bands, transversely coursing the sides. The first dorsal fin is somewhat larger than the second, and marked posteriorly by a particular dark spot. All the fins are tinged with a lively red, when first brought out of the water; the same colour is also observed on the under edge of the gill-membrane.

Silver Perch,—*Bodianus leucos.* Having white and glittering scales, an arched back and prominent abdomen, even

tail, a wedge-shaped head, good-sized mouth, smooth tongue, lateral line partaking of the curve of the dorsum, yellowish fins, with seventeen rays in the caudal, twelve in the dorsal, six in the ventral, and fifteen in the pectoral. This little fish varies from three to eight inches in length, is found in New Hampshire, Vermont, Maine, and, in fact, in all the rivers, brooks, and ponds in New-England and New-York.

Red Perch,—*Bodianus rufus.* This is a little larger than the silver perch, and, though denominated *red*, is really nearly black, after it has done spawning. Operculum serrated, the tail slightly forked, and the jaws and swallow set with fine sharp teeth. Usually, the three first rays in the anal fin are stiff,—very common wherever the others are found.

White Perch,—*Bodianus pallidus.* With scales appearing like spots on the sides; fins yellowish, with the exception of the dorsal, which is brown; the tail is not forked; the middle portion of the gill-cover rough and thorny; the two dorsal fins coalesce. Six branchial rays, fourteen pectoral, six ventral, nine dorsal, twelve anal, and twenty-five caudal.

Pond-Perch, is another common name in the country, for the same fish; we cannot discover any kind of difference whatever.

Yellow Perch,—*Bodianus flavescens.* Under favourable circumstances, for instance, in a deep, large pond, shaded by a thrifty growth of brush-wood on the margin, the yellow perch attains a large size, and becomes elegant in its proportions. In the pectoral fins are fourteen, ventral five, anal twelve, caudal eighteen or twenty, and dorsal fourteen rays.

As long ago as in the year 1790, Dr. Mitchell, of New York, conveyed three dozen of yellow perch in a churn, from Rockankama pond, in Suffolk, to Success pond, in Queens', a distance of forty miles, where they had never been seen, and from that period to the present time, they have continued to multiply and keep the water amply stocked. In our humble view, the yellow fins of the silver perch, entitle it to the name and rank of the one before us,—and further, we believe they are one and the same thing,—the trifling difference of colour depending on circumstances, repeatedly adverted to in various other places. The love and ambition of subdivision—the longing to be the creator of new genera and species, has introduced more confusion into works of natural history, than can be expurgated in fifty years of common sense to come.

The universal distribution of this family has led to some curious hypotheses of the manner in which the ova were dispersed. About fifty years ago, all at once, perch were discovered in all the lakes in Ireland, and in the Shannon.

Mr. Clinton quotes the remark from Gmelin, that ducks may swallow the eggs of fishes and eject them again, unhurt, so that they will afterwards come to maturity. Adanson, in Africa, observed small fishes, in morasses formed by recent rains, which were red, and lively. Whenever the water was evaporated they died, and after a new rain others appeared like them. Within six or seven years, early walkers discovered on Boston common, one morning, an immense number of live fishes on the grass. In this case, the wind had an agency.

Dr. Hosack, many years since, had an artificial pond excavated in a botanic garden, which, to the utter surprise of everybody, was speedily supplied with little fish. All these instances of the spontaneous birth of fish are not so very miraculous as would at first appear. Birds are the unquestionable agents in the transportation of the ova, either in their own bodies, or sometimes by actually carrying the body of a dead fish, filled with ova.

Ponds may be successfully stocked, by carrying the eggs in water. The Chinese practise this, profitably. Fish may be transported from country to country in a jar of water, if careful to change it occasionally, on the voyage. An electrical eel, in this way, was brought to Boston from South America, alive.

The following fish belongs to the fourth division of the family *Percoides*, distinguished by irregular teeth, a branchial membrane with seven rays, opercula dentated, or set with some sort of spines,—and lastly, according to the system of classification we are pursuing, should be grouped with the *Perseques.*

Striped Basse, Rock-Basse,—*Perca labrax.* [Linn. Sciæna Bloch.] On the sides are parallel lines, like narrow ribbons, eight in number, which give it the name of striped basse; the scales are large, of a metallic lustre; in the operculum the middle plate is serrated; the last portion of the third plate, the gill-cover, constituted of three pieces, has two nearly concealed spines.

In the branchial membrane are seven rays, pectoral sixteen, ventral six, dorsal eight in the first, and fourteen in the second, anal fifteen, and in the caudal seventeen; some of them in each fin, according to the size it would appear of the individual, are stiff or spinous.

Three or four of the stripes reach the tail,—the number not always being constant; and the remainder gradually disappear at different points on the abdominal walls; the eyes are white, the head strikes one as being long, and the under jaw, as in the pike, juts beyond its fellow. Next to the mackerel, this is decidedly the handsomest of the native fishes.

Basse, says the late distinguished De Witt Clinton, is a Dutch word, signifying *perch*. The resemblance between the fishes in Lake Erie, and those in the Atlantic, is so striking, that they must be referred to a common origin. It cannot be true that our inland fresh-water seas were peopled with aquatic beings when the deluge subsided. That some of the lakes may have received inhabitants in that way, we should not attempt to deny; but that there has been no other mode of stocking them, is so unphilosophical, that it would greatly embarrass a man to maintain an argument to that effect. In this same Lake Erie, are found the *rock-basse*, and the *white basse*, a fac-simile of the striped basse of the ocean; yet nothing would be more difficult than to hold a water communication with the sea. Even the *herring*, supposed to require salt water, at least some part of the year, is a steady resident of this lake.

Our remarks on the probable manner in which eels are distributed over the country, will also explain the mystery of these Atlantic fishes being in fresh water, equally developed, and obviously *climated*,—because the species have not become deteriorated,—birds have doubtless been the agents in transporting the spawn.

Striped basse are a sea fish, but principally subsist near the mouths of rivers, up which they run as high as they can conveniently go. During the approach of winter, instead of striking out into the deep water of the open ocean, like most other anadromous species, the basse finds a residence in ponds, coves, rivers, and still arms of the sea, where, undisturbed and comfortable, it remains till the following spring. The principal rivers in the state of Maine, as the Penobscot, &c., are the places where they are now taken in the greatest abundance, and of the finest flavour and size. In all the rivers, too, of Massachusetts, they are also found, at the inclement season of winter, but the fishery is not so productive as in Maine, whence the best in the Boston market are annually brought.

It is thought that the basse remains more constantly on the coast, through the year, than almost any other fish, being taken in every month, but most valued in the keen, severely cold weather of winter. They weigh from three to fifty pounds.

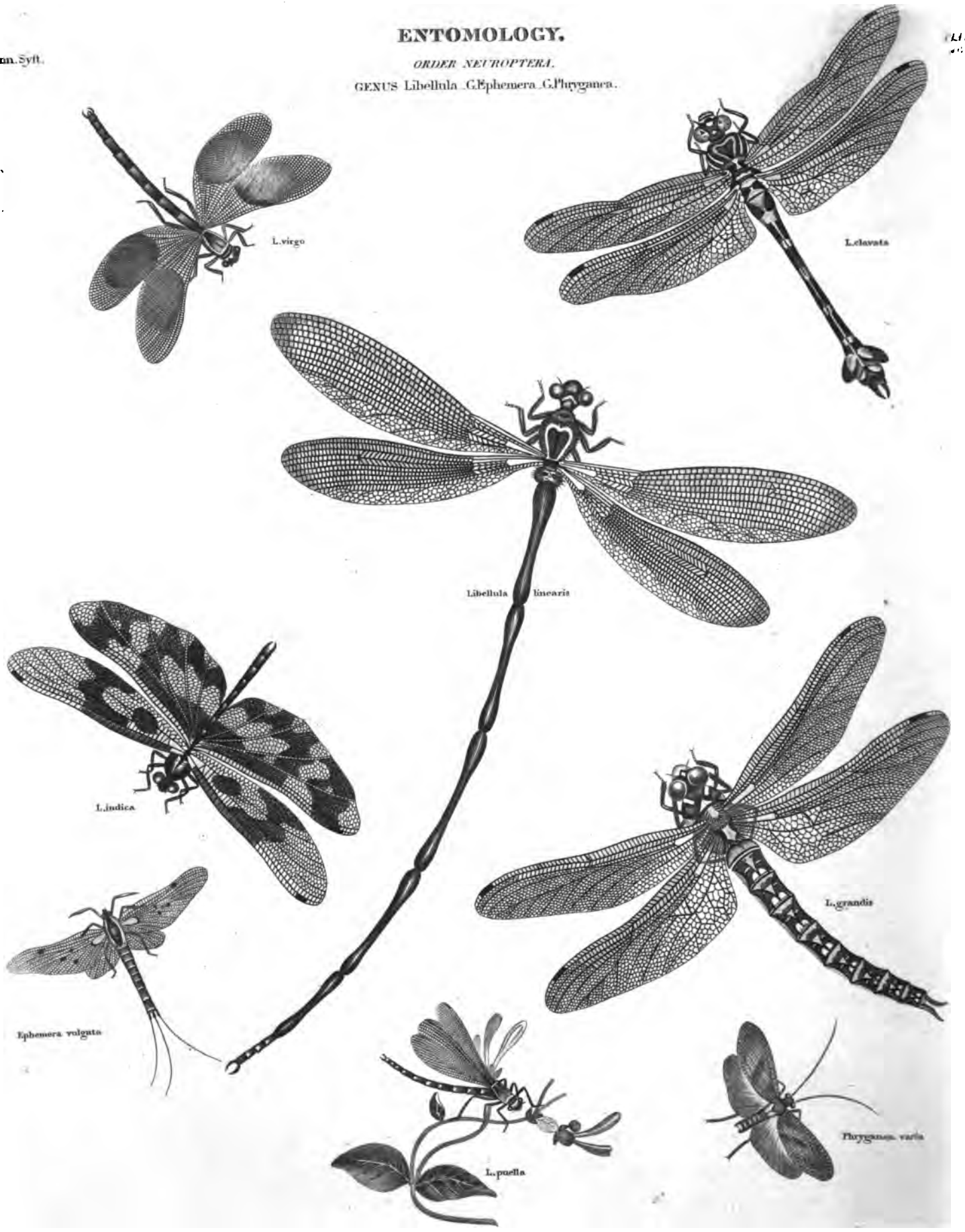
A striped basse, weighing forty pounds, was taken by a coloured servant, on the banks of Harlæm river, a little south of the bridge. The fish was discovered by the man, from the end of the dock, which projected some distance into the river. At times he would sail gently along past the dock, into quite shoal water; but how to capture him, was the question. No net, or hook and bait was at hand, and, as the golden opportunity might not last long, our hero resolved to encounter him

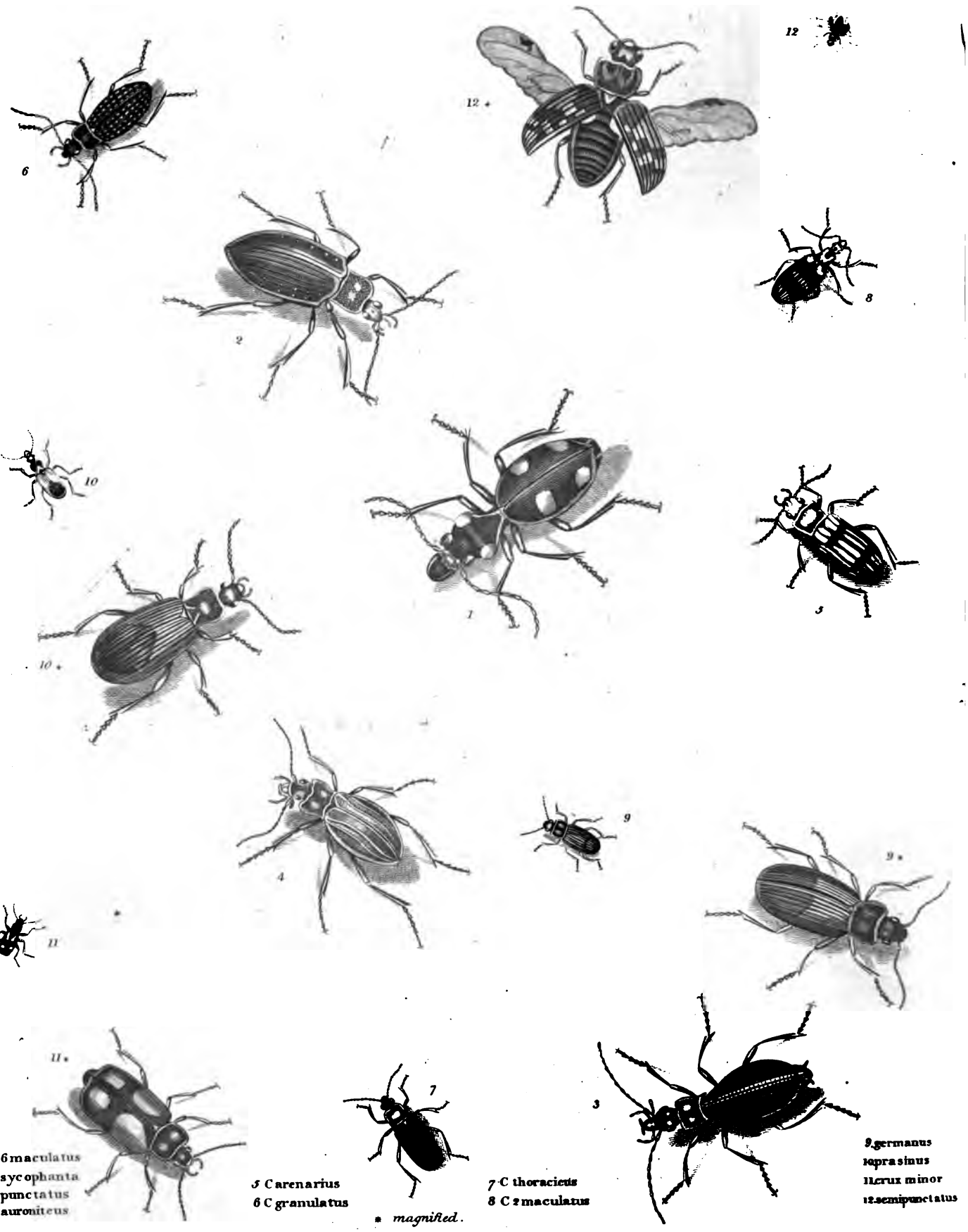
ENTOMOLOGY.

Linn. Syst.

ORDER NEUROPTERA.

GENUS Libellula .G.Ephemera .G.Phryganea.





1 C 6maculatus
2 C sycophanta
3 C punctatus
4 C auroniteus
5 C arenarius
6 C granulatus
7 C thoracicus
8 C 2maculatus
9 germanus
10 prasinus
11 crux minor
12 semipunctatus

a *magnified.*

single-handed, in his native element, and, at a favourable moment, he leaped from the dock directly upon his back. The affrighted fish darted from under him, as though a shark was in pursuit, and as luck would have it, took a direction for the shore, and ran up nearly high and dry into the mud. Before he could get fairly afloat again, and have plenty of sea-room to make his escape, the coloured man seized him by the gills, dragged him upon the beach, and secured his prize.

Not many years ago, there was a strange and fatal epidemic raging among the basse in Boston harbour. Great numbers floated towards the navy-yard, at Charlestown, much swollen, and speedily putrescent after coming to the surface. Whether some deleterious matter from the common sewers of the city poisoned the water, or whether a contagious disease was propagated from one to the other, could not be ascertained. That a small quantity, comparatively, of poison, may be so generally diffused, as to exert a deleterious influence on aquatic life, has been conclusively proved, in the case of the sinking of a small cargo of lime, which caused the death of an incredible number of fishes. That epidemics occasionally prevail in the ocean, appears to be admitted, proving exceedingly destructive to particular species.

When the new volcano of Graham's Island appeared between the island of Pantellaria, and Seiacca, on the south-west part of Sicily, distant about thirty miles from either place, in 1831, the havoc the heated water and sulphureous vapour made among the fishes, was indeed extraordinary. Millions of them were seen, for miles around, floating on the tops of the restless waves, either dead, or in the last agonies of death.

By what authority Dr. Mitchell gave his own name to the striped basse, "*Perca Mitchilli*," we cannot divine; he might with equal propriety have tacked his name to the white shark, or the bones of the mastodon, and the last would have savoured less of vanity, than the affixing his cognomen to a common table fish, known from time immemorial, all over Europe. These remarks are not made in a spirit of envy, nor with a disposition to be disrespectful towards the memory of an eminently distinguished American naturalist.

"If," says Governor Clinton, "the whole world contains one thousand species of fish, as is said, it is not unreasonable to suppose the United States and their dependencies contain between three and four hundred." We fully assent to the opinion of the probable number of species, but, so far from consenting to the supposition that four hundred of them live upon the Atlantic coast of the United States and the inland waters, we confess our belief is that the number will fall far short. Nature has been bountiful beyond the deserts of the country, in natural productions, but we are too apt, in the love of home, to overestimate its comforts—not that we would be understood, as it regards their value to ourselves, but as they would be estimated by the stranger.

Our coal mines are no better than those of England, our metals are neither more abundant nor purer; the birds in America are not more musical than on other continents, nor are the fishes more various, or of a superior quality; all our writers on natural history have fallen into an error, we apprehend, in multiplying species unwarrantably,—which will not only subject us to ridicule, but also retard the advancement of true scientific knowledge, by requiring the industry of future writers, to correct old and deep-rooted errors.

PLATE CLVI.—ENTOMOLOGY.

It is observed by M. Latreille, that among the numerous insects of the class NEUROPTERA, none are more light and graceful than those of the genus LIBELLULA. The beautiful and variegated colours with which they are adorned, their large wings, resembling lustrous gauze, and the velocity with which they pursue those insects that constitute their food, attract our attention, and enable us to recognize them with facility. Their head is large, rounded, or in the form of a triangle. They have two great lateral eyes, and two simple ones on the vertex; two antennæ inserted into the forehead; a semi-circular arched labrum; two very strong dentated mandibles; maxillæ spinous, dentated, and ciliated on the inner side; a thick and rounded thorax; an elongated abdomen, and short legs, curved forwards.

The larva and chrysalis inhabit the water until the period of their ultimate metamorphosis, and, with the exception of the wings, resemble the perfect insect. Having arrived at the period of metamorphosis, they issue from the water, climb along the stems of plants, fix there, and divest themselves of their skin.

The annexed plate illustrates six species of this genus.

FIG. 1. *Libellula virgo*, LINN. and LAT. Inhabits Europe.

FIG. 2. *Libellula clavata*, LINN. and LAT. Inhabits China.

FIG. 3. *Libellula linearis*, LINN. and LAT. Inhabits India.

FIG. 4. *Libellula indica*, LINN. and LAT. Inhabits India.

FIG. 5. *Libellula grandis*, LINN. and LAT. Inhabits Europe.

FIG. 6. *Libellula puella*, LINN. and LAT. Inhabits Europe.

The genus EPHEMERA has received its name from its short term of life in its perfect state. Their body is long, soft, and tapering, and terminated posteriorly by two or three long, articulated setæ. The antennæ are small and three-jointed. The wings are always placed perpendicularly, and the legs are very slender.

The European ephemeræ usually appear at sunset, in fine weather, along the banks of rivers, lakes, &c.—sometimes in such innumerable hosts, that after their death, the ground is thickly covered with their bodies: in certain places, even cart-loads have been collected for manure.

These insects collect in flocks, balancing and flitting in the air. The propagation of their species is the only function they have to fulfill, for they take no nourishment, and frequently die on the day of their metamorphosis. If, however, we trace their existence back to their larva state, we find their career to be much longer, extending from two to three years: in this state they live in the water, frequently concealed, and inhabiting tubular cavities in the mud.

FIG. 8. *Ephemera vulgata*, LINN. and LAT. It has four wings; three filaments at the extremity of the abdomen; its abdomen is of a deep yellow, with black spots, and the wings are spotted with brown. It inhabits Europe. *Cuvier*, vol. iv.

The genus PHRYGANEA embraces many species; they all fly at night, or during the evening, diffuse a disagreeable odour, frequently penetrate into houses, and are very quick in their motions. Their larvæ inhabit tubes that are usually cylindrical, covered with various substances which they find in the water, such as sand, little shells, seeds, &c., often symmetrically arranged. It carries its domicile with it, and when the period of metamorphosis arrives, it perforates one end of the tube, and leaves it for ever.

FIG. 7. *Phrygania varia*, LINN. and LAT. A common European species.

PLATE CLVII.—ENTOMOLOGY.

The genus CARABUS, of Linnæus, belongs to the order COLEOPTERA, and embraces a vast number of insects, which, however, have more recently been separated into many additional genera. Carabus, of Linnæus, has for essential characters, filiform antennæ, a somewhat heart-shaped thorax, trun-

cated behind, and with marginated wing-cases. It has six feelers, an ovate abdomen, and the posterior thighs furnished with basal appendages. The mouth is small, the legs long, and the thighs compressed.

Fig. 1. *Carabus sex-maculatus*, Linn. *Anthia sex-maculata*, Lat.

Fig. 2. *Carabus sycophanta*, Linn. *Calosoma sycophanta*, Lat. Inhabits Europe.

Fig. 3. *Carabus punctatus*, Linn. and Lat.

Fig. 4. *Carabus auroniteus*, Linn. and Lat. Inhabits Germany.

Fig. 5. *Carabus arenarius*, Linn. *Nebria arenaria*, Lat. Inhabits Wales.

Fig. 6. *Carabus granulatus*, Linn. and Lat. Inhabits Europe.

Fig. 7. *Carabus thoracicus*, Linn. Inhabits the Cape of Good Hope.

Fig. 8. *Carabus bimaculatus*, Linn. and Lat. Inhabits India.

Fig. 9. *Carabus germanus*, Linn. Inhabits Germany.

Fig. 10. *Carabus prasinus*, Linn. *Anchomenus prasinus*, Lat. Inhabits Europe.

Fig. 11. *Carabus crux-minor*, Linn. *Lebia crux-minor*, Lat. Inhabits Europe.

Fig. 12. *Carabus semipunctatus*, Linn. *Bembidium semipunctatum*, Lat. Inhabits New South Wales.

Many of the insects of the preceding genus possess the same habits of life. Their larvæ live in the earth, under stones or in decayed wood, and are, for the most part, unknown. In the last, or perfect state, a number of the species are destitute of wings, but they are remarkably active, and run swiftly. Some kinds, avoiding the light, appear only in the night time, while others ramble about in the middle of the day, and seem to be most vigorous when the sun shines intensely hot, at which time numbers of them are seen running in pathways and sandy places. If these insects are closely pursued, they emit a strong and highly fetid odour, and when caught, eject both from the mouth and vent, a greenish liquid of an extremely acrid nature.

This offensive humour seems to be a provision of nature, designed to compensate for having denied those creatures wings to facilitate their retreat from other voracious insects, the smell alone being sufficiently repulsive to check their pursuers. One or more species of Carabi have also the faculty of making a snapping kind of noise, which some have compared to the explosion of a musket in miniature. This faculty is more completely exemplified in the little species which the French call *Bombardier*. (*Carabus crepitans*, Linn.) It has been asserted that this insect, on being pursued, emits a blueish, fetid, and penetrating vapour, accompanied by an explosive sound; and this operation can be repeated ten or even twenty times in succession.

The ancients supposed the Carabi to be poisonous, and supposed that if their cattle happened to devour any of them, an inflammation of the intestines would ensue. These insects also formed an article in the Materia Medica; for both Hippocrates and Pliny attribute to them the virtues of cantharides.

PLATE CLVIII.—CONCHOLOGY.

The genus Serpula embraces those animals which live in shelly tubes, covering shells and other marine bodies.

The body of the animal is composed of numerous segments; its anterior portion is spread into a disk, armed on each side with coarse hairs; on each side of its mouth is a branchial tuft, fan-shaped, and of very bright colours.

Fig. 1. *Serpula reticulata*, Linn. and Lam.

Fig. 2. *Serpula tortuosa*, Linn. and Lam.

Fig. 3. *Serpula vermicularis*, Linn. and Lam. Inhabits the seas of Europe.

Fig. 4. *Serpula triquetra*, Linn. and Lam. Inhabits the ocean, adhering to shells, stones, &c.

Fig. 5. *Serpula vermicularis* and *S. triquetra*, attached to a valve of *Modiola papuana*. Europe.

In the genus Siliquaria there is a fissure the whole length of the shelly tube: Linnæus left these animals with the Serpulæ, from which they are now very properly separated.

Fig. 6. *Siliquaria anguina*, Lam. *Serpula anguina*, Linn. Inhabits the Indian Ocean.

Fig. 7. *Siliquaria papillosa*, Lam. *Serpula papillosa*, Linn.

In Dentalium, the shell is an elongated, arcuated cone, open at both ends, and has been compared to the tusk of an elephant, in miniature.

Fig. 8. *Dentalium elephantinum*, Linn. and Lam. A remarkably large, greenish, longitudinally ribbed species, from the Indian Ocean.

The genus Aspergillum is an elongated conical tube, closed at its largest extremity by a perforated disk, forming a kind of corolla.

Fig. 9. *Aspergillum penis*, Lam. *Serpula penis*, Linn.

PLATE CLIX.—ANIMALCULES.

In the class Infusoria is arranged a great number of minute animals, nearly gelatinous in their organization, and of most simple structure. The body is transparent, homogeneous, contractile, and microscopic; they have neither radiated tentaculæ nor rotary appendices; nor indeed any one special organ, not even for digestion; and they generate by shoots from their own body, thus affording the lowest link in animal organization, and that which approximates nearest to the vegetable kingdom.

In the genus Brachionus the animal is provided with a membranous or squamous shield, which covers, and in some measure protects, the back.

Fig. 1. to 6. *Brachionus expansus*, Cuv. In various states of expansion and retraction.

Fig. 7. *Brachionus striatus*, Cuv.

Fig. 8. *Brachionus tripus*, Cuv.

Fig. 9. *Brachionus uncinatus*, Cuv.

Fig. 10. *Brachionus quadridentatus*, Cuv.

In the genus Vorticella, (which is arranged by Cuvier among the Gelatinosi of his system,) there is a stem which is fixed, but branched and divided, each branch having a bell-shaped termination: from the aperture project two opposing groups of filaments, which are constantly in motion, and attract nutritious molecules for the sustenance of the animal.

Fig. 11. *Vorticella polypina*, Cuv.

Fig. 12. A cluster of the same, magnified.

Fig. 13. *Vorticella anastatica*. This group shows the manner in which they aggregate in clusters; it also gives views of the single-headed, double-headed, and quadruple-headed, varieties of this species.

Fig. 14. *Vorticella papyria*. A cluster.

Fig. 15. *Vorticella opercularia*. A group, showing the stilliform animal expanded.

Fig. 16. *Vorticella umbellaria*.

Fig. 17. *Vorticella digitalis*.

Fig. 18. *Vorticella nebulifera*.



S. reticulata



S. tortuosa





S. vermicularis



Serpula penis

S. triquetra et vermicularis



S. triquetra



Dentalium Elephantinum



S. filiformis



S. anguina



Serpula

ANIMALCULES.

CLASS, VERMES.

Order, Infusoria.

GENUS. I. BRACHIONUS.


1


2


3


4

Urceolaris


5


6



Striatus



Tripus



Uncinnatus



Quadridentatus

G. II. VORTICELLA.





Anastatica



Polypina





Anastatica



Umbellaria



Pyraria



Operularia



Digitalis



Nebulifera

W. Hamson, fec.

QUADRUPEDS

CLASS MAMMALIA. ORDER GLIRES. GENUS HYSTRIX. GENUS CAVIA.



1. Hystrix Cristata. Common or Crested Porcupine. 2. H. Prehensilis Brasilian Porcupine. 3. H. Dorsata Canadian Porcupine (White var.)
4. Cavia Aguti Long-nosed Cavy. 5. C. Magellanica. Patagonian Cavy. 6. C. Paca. Spotted Cavy.

PLATE CLX.—QUADRUPEDS.

Class Mammalia. Order Glires. Genus Hystrix. Genus Cavia.

Genus Hystrix.

Generic character. The incisory teeth are $\frac{2}{2}$; there are no canine teeth; the grinders are $\frac{4}{4}$; total 20. The grinders have flat tops, but furnished with ridges of enamel; the head is strong; the muzzle thick; the ears short and long; the tongue with spiny scales; the fore feet with four toes, and the rudiment of a thumb; the hind feet with five toes; the nails are strong; the body covered with spines, sometimes intermixed with hair; tail more or less long, sometimes prehensile.

Fig. 1. *Common or crested Porcupine. Hystrix Cristata*, Linn. and Cuv.

The crested or common porcupine, is about two feet in length, and some of its longest spines exceed a foot. Its general colour is a grizzled dusky black, in consequence of the intermixture of varied shades of white, brown, and black. The upper part of its head and neck are furnished with a crest of long light coloured hairs, which it can raise or depress at pleasure. The hair on the face and limbs is very short, and almost black on the latter; it is of a brownish cast on the neck, shoulders, and under parts, and rather long; all the other parts of the back and sides, rump, and upper surface of the hind legs, are armed with strong spines, which are longest on the back. These spines taper to both extremities; and are almost as thick as a goose-quill in the middle, supported at the base by a tender pedicle, and the points very sharp; the whole quills are striated longitudinally, and marked by alternate rings of black and white, an inch or more in breadth; these generally lie flat, but are raised while the animal is either under the influence of fear or passion.

M. Le Vaillant says, that the wound from a porcupine's quill is difficult of cure, from some poisonous quality it possesses; and mentions that one of his Hottentots, who was pricked in the leg by one of these, was ill for upwards of six months afterwards; and that a gentleman at the Cape had nearly lost his limb from a wound of a porcupine's quill: it occasioned his confinement to bed for nearly four months.

The porcupine is a native of Africa, and also of some districts of southern Europe. It lives under ground, in burrows of its own digging, which have several distinct openings, and only goes abroad in the evening in search of food, which consists entirely of vegetables, roots, leaves, and fruits. He is remarkably timid.

Several of these animals have been led through Edinburgh lately in a tame state. These were all very gentle in their nature, and exceedingly docile, and even familiar, to those who offered them any thing to eat.

The time of gestation is about seven months; the female produces one or two at a birth, which she suckles for a month. These she guards with the tenderest solicitude, and will rather die than desert them.

The flesh of the porcupine is said to be very palatable, and is frequently to be seen on the tables of the respectable inhabitants of the Cape of Good Hope, and used to be exposed in the markets at Rome for sale.

Curious Playmates.—Sir Ashton Lever had a tame porcupine, a domesticated hunting leopard, and a Newfoundland dog, which he often used to turn out together to play in a green behind his house. No sooner were the dog and leopard let loose, than they commenced chasing the porcupine, who uniformly, at the outset, tried to escape by flight; but when he found there was no chance of doing so, he would thrust his head into some corner, make a snorting noise, and erect his spines. His pursuers, if too ardent, pricked their noses, till the pain made them quarrel, which generally afforded him an opportunity of effecting his escape.

Fig. 2. *Brazilian Porcupine. Hystrix Prehensilis*, Linn. *Synetheres prehensilis*, Cuv. *Hystrix Cuandu*, Desmarest.

The Brazilian porcupine is about one foot, and the tail about eighteen inches, in length.

The head of this animal is small; the nose is extremely blunt; the teeth are large and strong; the ears are short, broad, and rounded; the feet have four toes on each, and a small tubercle, to represent the fifth toe, and are furnished with strong claws. The whole animal, except on the belly, and inside of the limbs, is covered with short, strong, and very sharp spines, of which the longest measures three inches, and are white, barred towards the point with black. The colour of the hair with which the hinder feet are covered, is dusky brown, and of a bristly texture. The tail is covered with spines, for about six inches from its base; the remainder with dusky hairs.

This species inhabits Mexico and Brazil. It lives in woods, climbs trees, and is said to feed on fruits and small birds. The time of seeking its food is by night, and it sleeps by day. The sound of its voice is like the grunting of a pig. It grows very fat; and the natives are fond of its flesh, which is said to be good.

Fig. 3. *Canadian Porcupine. Hystrix Dorsata*, Linn. *Eretison dorsata*, Cuv.

This species is a native of the northern parts of America, and is not uncommon in Canada. It is a short thick-bodied animal, approaching somewhat to the form of a Beaver, and is remarkable for the length and fullness of its fur, which is soft, of a dusky brown colour, and intermixed with longer and coarser hairs with whitish tips: the head is short; the nose blunt, the ears small and rounded, the teeth very strong, the limbs short, the feet armed with strong, crooked, sharp-pointed claws, hollowed or channelled beneath: on the fore feet are four toes, and on the hind five: the general length, from nose to tail, is about a foot and a half; of the tail, six inches. Edwards compares the size to that of a fox, though the shape is widely different. The spines are nearly hid in the fur, and are only visible on a close inspection: they are situated on the head and upper parts, as well as on the tail: the longest are those on the back, which measure about three inches, while those on the other parts are proportionally shorter: they are strong and sharp-pointed, and so formed as to appear, when examined with a magnifier, as if barbed at the tips with numerous, small, reversed points or prickles, and are so slightly attached to the skin as to be loosened with great ease: and the animal will sometimes purposely brush against the legs of those who disturb it, leaving several of the spines sticking in the skin.

The first figure of the Canada Porcupine seems to have been given by Edwards, from a specimen brought from Hudson's Bay. It is said to feed principally on the bark of the juniper tree. It drinks by lapping in the manner of a dog. It resides in holes under the roots of trees, on which, like some others of this genus, it often climbs; and is thus killed by the Indians, who consider it as a useful article of food: they also use the quills by way of fringes, and for the purpose of ornamenting their boxes, &c.

Though the natural or genuine colour of this animal is brown, yet it is sometimes found perfectly white, or cream-coloured: two very elegant specimens in this state occur in the Leverian Museum.

The Count de Buffon, with peculiar absurdity, affects to entertain a doubt whether the *iridescent porcupine* (*H. macroura*, Lin.), described and figured by Seba under the title of *Hystrix Orientalis singularis*, may not in reality be this species, and observes, that this would not be the only instance in which Seba has exhibited American animals as belonging to the East Indies. He then goes on to say, that the resemblances are very great, and the differences but slight. On the contrary, who-

ever takes the pains to collate the two animals will readily perceive that hardly any quadrupeds of the same genus can exhibit more strikingly different characters.

Genus Cavia.

Generic character. The incisory teeth are $\frac{4}{2}$; no canine teeth; the grinders are $\frac{4}{4}$; total 20. The body is thick; the muzzle short and compressed; the eyes large; the ears short and round; the legs short; the fore feet have four toes, and the hind feet three toes, which are not palmated; there is no tail; they have two ventral teats.

Fig. 4. *Long-nosed Cavy. Cavia aguti*, Linn. *Chloromys aguti*, Cuv.

This species is peculiar to the warmer parts of South America, and is extremely common in Guiana. Its general size is that of a rabbit: the body is plump, and thicker behind than before: the head is rather small, and somewhat compressed laterally; the snout long and sharpish; the nose divided at the tip, and the upper jaw longer than the lower: the eyes round and black; the ears very short, broad, naked, and rounded: the neck rather long, but thick: the legs thin, almost naked, and blackish: the hind legs are longer than the fore, and have only three toes: the tail is extremely short, naked and sometimes scarce visible: the hair on the whole animal is hard, strong, and shining, and is brown with a cast of orange colour, with blackish freckles, being, in reality, a mixture of red, brown, and black: the rump is orange coloured. This animal's manner of moving resembles that of a hare, and its voice is like the grunting of a young pig. It feeds on various roots, nuts, fruit, &c., and resides in woods, where it forms subterraneous burrows, and sometimes lodges in the hollows of trees.

According to Mons. de la Borde, a correspondent of the Count de Buffon, the Aguti is about the size of a hare: his skin is hard, and lasts very long when made use of as an upper-leather for shoes. His flesh is white, and nearly as good as that of the rabbit, having a similar taste and flavour; and whether old or young, it is always tender; but those which inhabit the sea-coasts are superior in this respect. They are taken in traps, or hunted with dogs. The Indians and negroes, who know how to allure them by whistling, or imitating their cries, kill as many as they please. When pursued, they conceal themselves, like rabbits, in the holes of old trees. They hold their food in their paws like squirrels. Their ordinary food, which they often conceal in the earth, to be used occasionally, are the nuts of the Maripa, the Tourlovri, the Corana, &c. and, after concealing these nuts, they often touch them not for six months. They multiply as fast as rabbits, producing three, four, and sometimes five young ones, during every season of the year. They live not in numbers in the same hole, but are either found alone, or else the mother with her young. They are easily tamed, and will eat almost every thing. When in a domestic state, they remove not to any great distance, and always return to the house spontaneously; but constantly retain somewhat of their wild disposition. In general they remain in their holes during the night, unless the moon shines bright; but run about most of the day. There are some countries, as about the mouth of the Amazon, where these animals are so numerous as to be often met with in scores.

Fig. 5. *Patagonian Cavy. Cavia Magellanica*, Linn. *Chloromys patagonica*, Cuv.

This remarkable species is a native of Patagonia, where it is said to be by no means uncommon. In size it considerably exceeds a Hare, and, according to Mr. Pennant, has been sometimes found to weigh more than twenty-six pounds. Its colour on the upper parts resembles that of a Hare; but the under parts are whitish, the breast and sides tinged with ferruginous: on each thigh is a large oval white patch, and the rump or region round the tail is black: the ears are long, rather broad, and sharp-pointed. On each side the nose is a tuft of short soft hair, exclusive of the long vibrissæ or whiskers. The legs are long; the claws long, straight, sharp, and black: they are four in number on the fore feet, and three on the hind. The tail is extremely short, as in the *Aguti*, being a mere naked stump or process. This animal is said to be an excellent article of food, the flesh being very white and delicate. It is called by Sir John Narborough, who seems to have been its first discoverer, by the title of a Hare.

Fig. 6. *Spotted Cavy. Cavia paca*, Linn. *Cœlogenys paca*, Cuv.

This is a large species, measuring near two feet in length. It is found in Guiana, Brazil, and other parts of South America; inhabiting holes formed under ground, and principally near the banks of rivers. It is of a thick, clumsy form, somewhat resembling that of a pig; for which reason it has been sometimes called the Hog-Rabbit. The head is round; the muzzle short and black; the upper jaw longer than the lower; the lip divided like that of a hare; the nostrils large; the whiskers long; the eyes large and prominent, and of a brown colour; the ears short, moderately large, round, and naked; the neck thick; the body very plump, larger behind than before, and covered with coarse, short, thinly scattered hair of a dusky colour, deepest on the back; the throat, breast, insides of the limbs, and belly, are of a dingy white; and on each side the body run five rows of roundish, slightly angular spots, situated pretty near each other: the legs are short; and the feet have five toes, four of which are armed with strong and sharp claws; that on the fifth toe being very small: the tail is scarce visible, being a mere small conical projection of scarce half an inch in length. The Spotted Cavy is a nocturnal animal, residing in a solitary manner in his hole during almost the whole day. In a domestic state it readily feeds on almost any kind of vegetable diet, and is particularly fond of sugar and fruits. It is much esteemed as an article of food by the South Americans. It is subject to some variety in point of colour, and has been sometimes seen quite white. Its general length, when full-grown, is about two feet. The female is said to produce but one young at a birth.

PLATE CLXI.—ORNITHOLOGY.

Order Picæ. Genus Corvus. Genus Coracias.

Genus Corvus. *Crow.*

The established characters of this genus, as well as of many others, must be received with a considerable degree of limitation; it being in vain to expect mathematical precision in particulars of this nature; and it must be confessed that many species of birds might with equal propriety be arranged under different genera. Most of the Crow tribe build on trees, and the general number of their eggs is observed to be five or six. They are often gregarious, and the major part of those found in Europe and America feed both on animal and vegetable substances. Their voice or note is hoarse and clamorous, but some species possess a considerable degree of docility, and may be taught to articulate in the manner of Parrots.—*Shaw.*

Fig. 1. *Raven. Corvus Corax*, Linn. and Cuv.

The Raven is the largest European species of the present genus. Its general length is about two feet two inches, and its breadth four feet: the bill is strong and black, and the upper mandible convex: the colour of the whole bird is black, finely glossed with blue, except on the belly, which is of a dusky colour. The Raven frequents woody places, generally in the neighbourhood of towns, for the sake of carrion and other offals on which it preys. It also attacks the smaller birds, and even, occasionally, young lambs, leverets, &c. It builds either on trees, or among rocks; and the nest is said to be composed



GENUS CORVUS (Crow) G. CORACIAS (Roller)

1. C. Corax. RAVEN. 2. C. Pica. MAGPIE. 3. C. Caryocatactes. NUTCRACKER. 4. C. Glandarius. JAY. 5. C. Cristatus CRESTED JAY. 6. C. Garrula. COM. ROLLER.

C. Tabout Sculp.

of roots and twigs, intermixed with the bones of the animals on which it has preyed, and is lined with moss, hair, &c.: the eggs are five or six in number, of a bluish-green colour, spotted with brown: the young, according to Aldrovandus, are at first rather white than black, contrary to those of the Swan, which are dusky at first, and afterwards grow gradually white.

The Raven may be called a general inhabitant of the globe, appearing to be equally common in the northern and southern regions of both hemispheres. It is naturally a long-lived bird. "What is reported (says Willughby) by Hesiod and others of the ancients, of the long lives of Ravens, is without doubt fabulous; but that all birds in general, compared with quadrupeds, are long-lived, we have already proved by divers examples in several kinds; and that Ravens are in the number of the longest-lived, we will not deny."

In the Count de Buffon's Natural History of Birds may be found an agreeable abridgement of many curious particulars recorded of this bird by ancient writers, collected from Aldrovandus, &c. These the brevity required in the present publication makes it most advisable to omit.

The only variety of the Raven worth particular mention seems to be the African or Cape Raven, described by Levaillant, which however differs in no other circumstance than that of being rather larger, of a somewhat browner colour, and in having the bill rather more curved. The other varieties of this bird are mere accidental differences of colour, which, though singular, and not easily accounted for, are yet more or less observable in many other birds; such as partial or total whiteness, pale-brown or buff-colour, &c. &c. and sometimes a mixture of black and white on different parts of the plumage.

FIG. 2. *Magpie. Corvus pica*, LINN. *Pica vulgaris*, CUV.

The general appearance and manners of this bird are so well known as almost to supersede the necessity of any description. Its length is about eighteen inches, and its breadth twenty-four, the wings being short in proportion to the bird. The Magpie seems to be confined to the temperate and northern regions both of the old and new Continent. In its way of life it resembles the Crow, feeding both on animal and vegetable substances: it builds its nest, as every one knows, with great art and sagacity; defending it on all sides with sharp thorns, leaving only a hole for entrance, and lays six or seven pale-green eggs spotted with brown. The beauty of the Magpie, which, on a distant view, appears to be clothed merely in black and white, is greatly increased by the rich iridescent reflexions of the feathers, particularly those of the tail, which exhibit a changeable green and purple lustre, according to the disposition of the light. Like the Jay, this bird is often doomed to a state of vulgar captivity, in which its appearance partakes of the cast of those who confine it; the beautiful gloss of its colours being lost, and nothing remaining but a dirty variegation of black and white. The varieties of the Magpie are white, pied, and buff-colour.

FIG. 3. *Nut-cracker. Corvus caryocactactes*, LINN. *Caryocactactes vulgaris*, CUV.

Size of a Magpie. Native of the middle parts of Europe, and most frequent in Germany: bill and legs black: in its manners resembles the Jay, and is said to breed in the hollows of trees: very rarely seen in England, and then only as an accidental straggler. There is but one species of this genus.

FIG. 4. *Jay. Corvus glandarius*, LINN. *Garrulus glandarius*, CUV.

The Jay, which must be considered as the most elegant British bird of this genus, measures about thirteen inches in length, and is of a moderately stout or thick form: its general colour is a light purplish buff, paler on the under parts; the wings black, with a large white spot or patch in the middle: the larger quills are edged with whitish ash-colour, and the smaller are deep ferruginous with black tips: the covert-feathers are of a most brilliant glossy pale blue, crossed by numerous bars of deep black, each accompanied by a narrow white edge: the head is covered with small narrow or lanceolate plumes, which can be slightly erected at the pleasure of the bird into a kind of crest: those on the forehead being whitish with a black streak along the shaft: on each side the head, beneath the eye, is a large oval black spot or patch, proceeding from the corners of the lower mandible: the rump and vent are white; the bill and tail black; the former notched on each side near the tip, and the latter slightly cuneated at the end: the legs are flesh-coloured; the irides white.

This bird is found in most of the temperate parts of Europe, frequenting woods, and feeding on acorns, beech-mast, berries, and fruits of various kinds, as well as on insects, and even sometimes on the smaller birds and their young. It builds in trees, forming the nest of the fine fibres of roots, strengthened externally by twigs: the eggs are five or six in number, and of a dull whitish olive-colour, obscurely mottled with pale brown. The young are observed to follow their parents till the succeeding spring. The natural note of the Jay is harsh and loud; and when calling its young ones, resembles the mewing of a cat; but this bird, like the Raven, the Crow, the Jackdaw, and the Magpie, may be taught to articulate pretty distinctly in the manner of a Parrot, and is frequently caged for that purpose. In confinement however it loses the beauty of its plumage, and becomes of a dull or brownish tinge. Monsr. Sonnini observes that Jays spend a good part of the winter in the hollows of trees, among their collections of acorns, pease, &c. appearing only in those mild days which occasionally happen during that season. He also observes that it is no uncommon circumstance for Jays to migrate in great numbers in quest of a warmer climate. In some parts of the Levant they arrive in troops about the beginning of autumn, and depart early in the spring. It is stated in the Naturalist's Miscellany, that during the early period of the French revolution, when persons of all ranks had suddenly obtained the unlimited power of ranging the woods and forests in quest of game, vast flocks of Jays, terrified by the unusual noise of the guns, flew over to the nearest opposite coasts of England, instead of endeavouring to escape by retreating into other parts of the country; and, on some of the coasts, these birds were observed in vast numbers, seemingly exhausted with fatigue, yet endeavouring to gain the nearest wooded retreats.

A white variety of this bird, with red irides and white bill and legs, is recorded by Mr. Latham, taken in the nest with four others of the usual colour. Another is mentioned by the Count de Buffon, which had also red eyes, but which still retained the beautiful blue mail of the wing-coverts.

FIG. 5. *Crested Jay. Corvus cristatus*, LINN. *Garrulus cristatus*, CUV.

A most elegant species; considerably smaller than the English Jay, with the tail much longer in proportion, and strongly cuneated: head considerably crested, with loose silky plumes: bill black; legs brown: whole bird above fine blue, with the wings and tail marked by numerous black bars: neck encircled with a black collar: under parts blossom-colour, with a slight cast of blue: tail tipped with white. Native of North America, where its manners are similar to those of the European Jay.

Wilson's description of this elegant bird is so universally known, as to make it unnecessary for us to copy it here

Genus CORACIAS. *Roller.*

The genus Coracias is in general distinguished by peculiar elegance and splendour of colours. In some species the tail is nearly even, the exterior feather on each side extending very little beyond the rest; while in others it is lengthened to a very considerable distance, rendering the tail strongly forked. It happens, however, somewhat unfortunately for the exact discrimination of the species, that some of the long-tailed division, in their less advanced period of growth, have the tail nearly

even; the lengthening of the side-feathers not taking place till the birds have attained their full perfection of plumage. It may also be strongly suspected that in some species the males and females may differ in this respect; and hence a very excusable uncertainty must continue to pervade this beautiful genus, which nothing but a long and perfect acquaintance with the respective birds in all their stages of growth in their native regions can entirely elucidate. In their manners they are, in general, allied to the granivorous and insectivorous part of the Crow tribe, and only one species, the Coracias garrula or Common Roller, has yet been discovered as a native of any part of Europe.

FIG. 6. *Common Roller. Coracias garrula*, LINN. and CUV.

The common or European Roller is about the size of a Jay, and is a bird of an elegant shape: the bill is black; the orbits of the eyes bare, and beyond each eye is a small bare spot or tubercle: the head, neck, breast, and under parts are of a light bluish or sea-green colour, the feathers of the neck and breast marked by a pale streak down the shaft of each: the shoulders or parts invested by the smaller wing-coverts are of a rich ultramarine blue; the larger coverts bright sea-green; the lower part of the smaller wing-feathers ultramarine blue, forming a moderately large patch of that colour on the middle of the wing; the remaining part of the wing black: the back and scapular feathers testaceous or pale chestnut; the rump ultramarine blue, and the tail dull green, the two exterior feathers, which generally exceed the rest about half an inch in length, tipped with black, the black tip being blue beneath, as are also the black ends of the wing-feathers: the legs are rather short, and of a dull reddish-brown colour. In some individuals the back is of a brighter or redder cast than in others, and the tail sometimes appears nearly even at the end. This beautiful bird is found in many parts of Europe, but has very rarely made its appearance in England, and that only from some accidental circumstance attending its migration from other parts. In some parts of Germany it is said to be not uncommon, as well as in Italy, Spain, and France. It has even been observed in so northern a region as Sweden, but in general it appears to be most frequent in the warmer parts of the Old Continent, and particularly in Africa. It is said to build in woods, and to feed in the manner of the Rook, on worms, grain, and roots. Its note is loud and chattering, from whence is supposed to be derived its name.

PLATE CLXII.—ORNITHOLOGY.

Order ANSERES. Genus ANAS.

FIG. 1. *Black Swan. Anas atrata. Cygnus atratus*, CUV.

Nearly the size of the Tame Swan: extent of wing, from the tip of one to that of the other, four feet eight inches: its beak is large and red, with its tip palest: at the base of its upper mandible, near the nostrils, is a bifid protuberance; its under mandible is red on the sides, and white beneath: the irides are red: the prevailing colour of the plumage is of a deep black, with all the primary quills, the greater part of the secondaries, and part of the wing-coverts, white: the belly and thighs are cinereous: the legs brownish flesh-colour. The female is destitute of the basal protuberance on the beak.

This bird inhabits various parts of New Holland, and is said to fly in small flocks of eight or nine each: its habits are but little known; but in a domesticated state their food is similar to that of the common species. It is frequently kept as an ornament in parks in England, and there are several on the estate of Lord Cowper, at Panshanger, near Hertford. Its notes are represented as being particularly sweet and melodious, though not of long continuance.

FIG. 2. *Tame or Mute Swan. Cygnus olor*, LINN. and CUV.

Its beak is red, with the exception of the edges of the mandibles, the hook, the nostrils, the protuberance, and the space round the eyes, which are deep black: the irides are brown: the entire plumage is of a pure unsullied white: the legs are black, slightly shaded with reddish. The female is smaller, the rostral protuberance is less, and the neck more slender. The young of the year are of an ashy-brown, with the beak and the legs of a lead colour: in the second year the beak becomes yellowish, and the plumage is varied with white and gray; in the third year the plumage becomes perfectly white. There is not any remarkable particularity in the form of the trachea of this species, which passes straight into the lungs.

The tame Swan is found, in its wild state, in the great seas of the interior of the eastern countries of Europe and of Asia; and domesticated, it occurs in almost every European country. In the river Thames they are in great plenty, where they are royal property, and it is felony to steal their eggs. At Abbotsbury, in Dorsetshire, there was formerly a noble swannery, the property of the Earl of Ilchester, where six or seven hundred birds were kept; but of late years this collection has been much diminished. In former times, and previously to the dissolution of monasteries, they frequently amounted to more than double the number.

Swans are supposed to live to a great age, but no satisfactory evidence has yet been brought forward to prove the assertion: they are strong and active birds, and will swim faster than a man can walk; and while their young are incapable of protecting themselves, they are at times extremely fierce, and have been known to throw down and trample upon youths of fifteen or sixteen years of age. It is related that a female, while in the act of sitting, observed a fox swimming towards her from the opposite shore; she instantly darted into the water, and having kept him at bay for a considerable time with her wings, at last succeeded in drowning him; after which, in the sight of several persons, she returned in triumph.

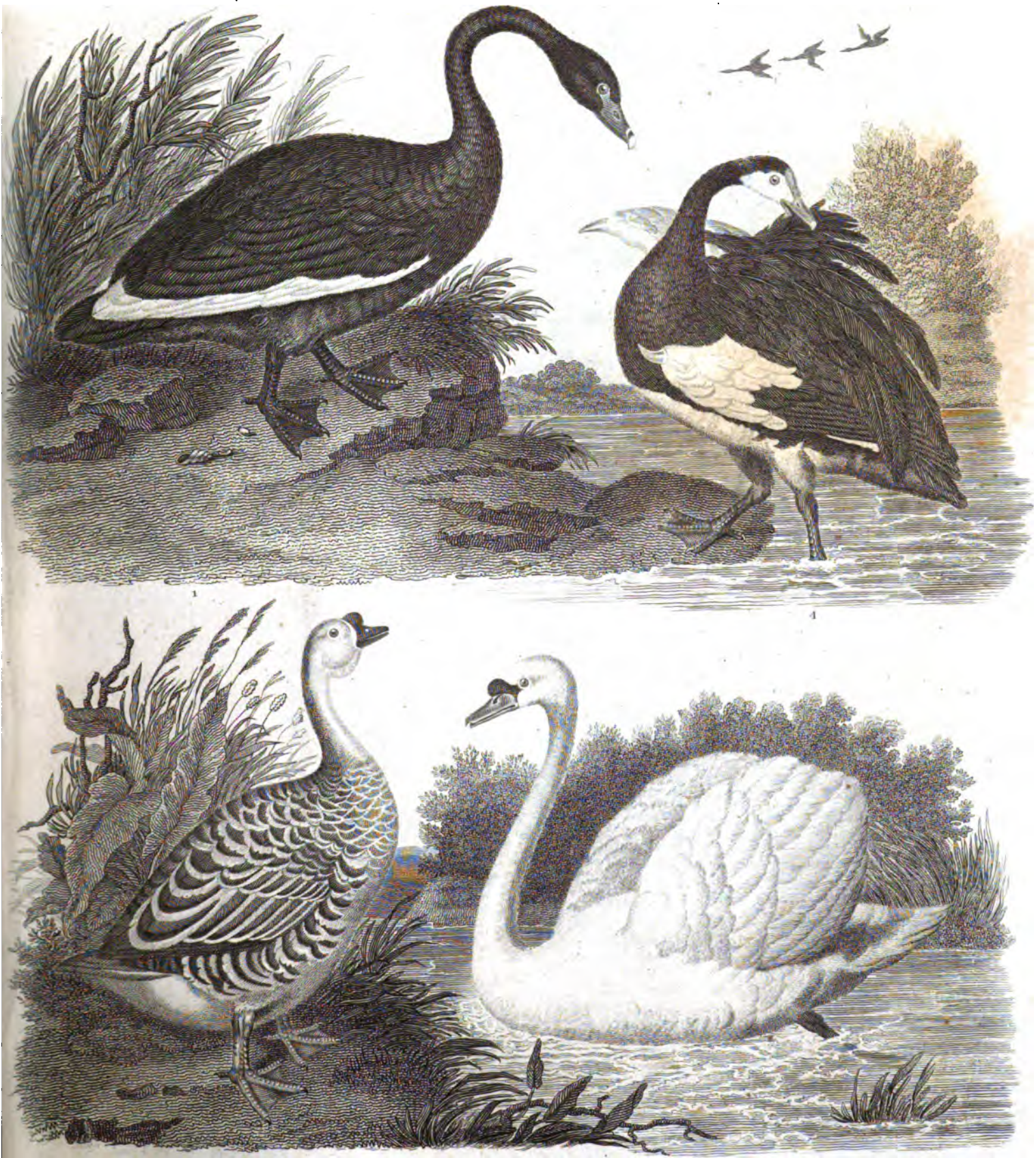
They make their nest of grass, among reeds; and in February begin to lay, depositing a white egg every other day till there are six or eight: they are hatched in about seven or eight weeks. The young do not acquire their full plumage till the second year: during this period they are called cygnets, and in former times were much esteemed as food, though at present they are not in so much demand, although they are sometimes fattened for the table, and sold commonly for a guinea each, and sometimes for more. The flesh of the old birds is very hard and ill tasted.

Nothing can exceed the graceful and elegant appearance of these birds when gently sailing along on the glassy surface of the water, throwing themselves into the proudest attitudes imaginable before the spectators; but when kept out of the water and confined in a court-yard, they become dispirited, dirty, and awkward in their movements.

An exhibition of this bird recently delighted our citizens, at the Philadelphia Water-Works.

FIG. 3. *Chinese Goose. Anas cygnoides*, LINN. and CUV.

Upwards of three feet in length, and intermediate in size between the Domestic Swan and the Common Goose: it has a large knob at the base of the upper mandible of the beak, and a nearly naked skin, hanging down like a pouch, or wattle, under the throat: a white line extends from the corners of the mouth over the forehead: the base of the beak is orange: irides reddish-brown: on the hinder part of the neck, from the head to the back, runs a dark brown or blackish stripe: the fore part of the neck and the breast are yellowish-brown: the back and all the upper parts are brownish-gray, edged with a lighter colour: the sides and the feathers which clothe the thighs, are nearly similar in colour to that of the back, and edged with white: the belly is white: the legs orange. This species varies much in the colour of its plumage, beak, and legs, and the female is usually smaller than the male: she has the head, neck, and breast fulvous, paler on the upper part: the back, wings,



GENUS *ANAS*
(Swan)

1. A. *Atrata*. BLACK S.

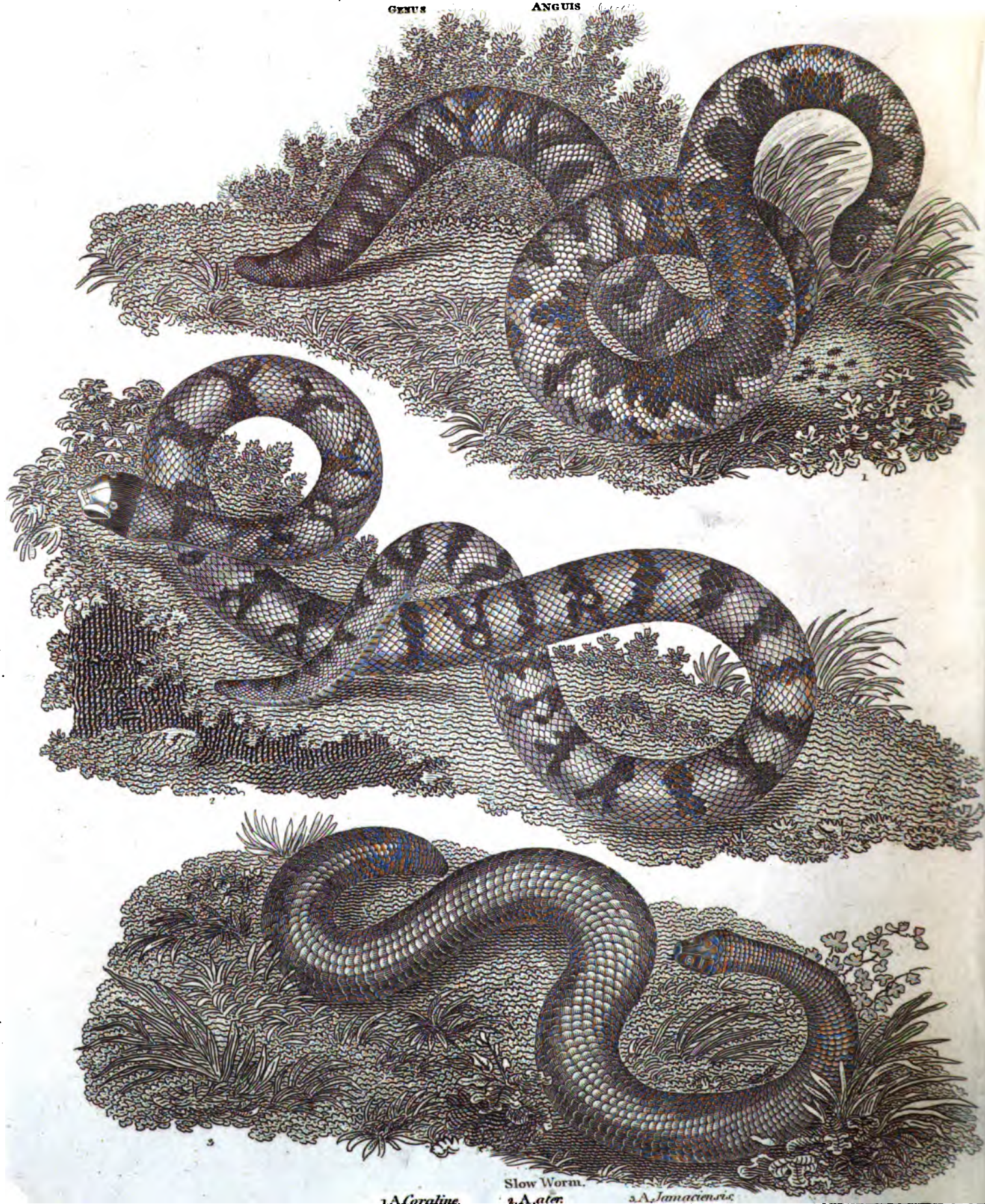
2. A. *Olor*. TAME S.

3. A. *Cygnoides*. CHINESE GOOSE.

4. A. *Cunbensis*. SPUR WINGED G.

AMPHIBIA.

GENUS ANGUIS

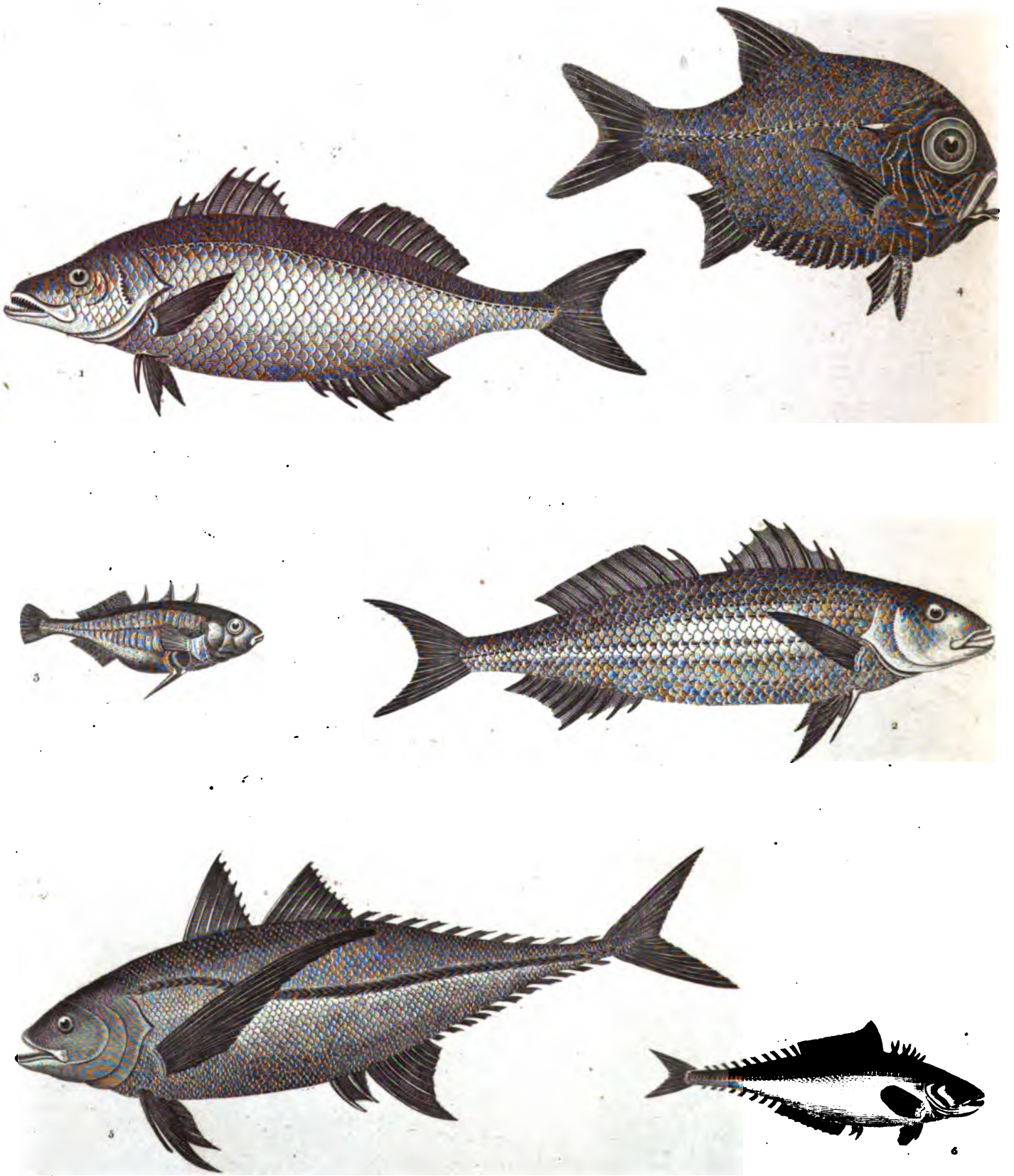


Slow Worm.

1. A. coraline. CORAL S.

2. A. ater. BLACK BANDED S.

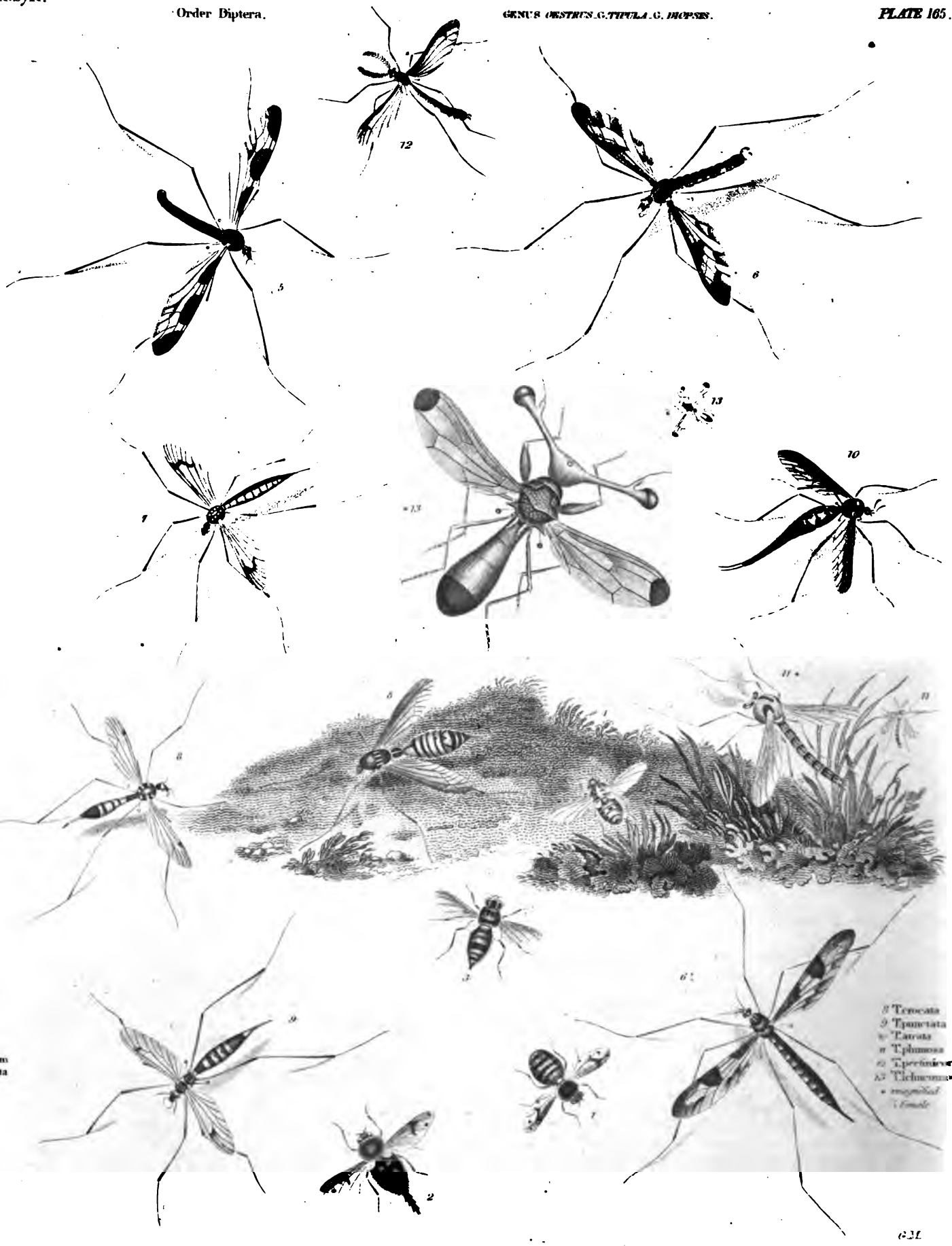
3. A. Jamaicensis. JAMAICA S.



GENUS *SCIÆNA* — G. *GASTEROSTEUS* (Stickleback) — G. *TRACHYCHTHYS* — G. *SCOMBER* (Mackerel)

1. Sc. *Undecimalis* — 2. Sc. *Lineata* — 3. G. *Aculeatus* — 4. *Australis* — 5. S. *Rotleri* — 6. S. *Aculeatus*

J. Williams.



1 O.Equi
2 O.Equi
3 O.bovis
4 O.ovis
5 T.rivosa
6 T.hortorum
7 T.variegata

8 T.crocata
9 T.punctata
10 T.atrata
11 T.plumosa
12 T.pectinicornis
13 T.lichnumnis
* magnified
\ female

and tail dull brown, with pale edges: the belly white: knob on the beak smaller than in the male.

Said to have been brought originally from Guinea, and to be common about the Lake Baikal in Siberia, and in Kamtschatka. They are now pretty generally diffused over the European continent in a domesticated state, and are said to be more noisy than the Common Goose, sounding the alarm by their hoarse cacklings and loud shrill cries. They will breed, it is asserted, with the Common Goose, and their offspring are as prolific as those of any other kind!

FIG. 4. *Spur-winged Goose. Anas gambensis*, LINN. *Cygnus gambensis*, CUV.

Size of the Wild Goose: its beak is upwards of two inches long, and red: the cheeks and chin are white: the neck, sides of the breast, the back, rump, and tail black, with a purple gloss on the back: the outer wing-coverts, inner ridge and bend of the wing, the middle of the breast, and all the under parts white: the spurs of the wing horn-coloured; the rest of the wing purplish-black: the legs red. Inhabits Gambia and other parts of Africa.

This species has two spurs on the bend of the wing, and a large knob at the base of the beak.

PLATE CLXIII.—AMPHIBIA.

Genus ANGUIS. *Slow-worm*

This genus is easily distinguished by having the abdomen and under part of the tail covered with scales of similar appearance to those on the rest of the animal, except that in some few species they are rather larger: to this may be added, that the body is of a shorter and more uniformly cylindric form than in the genus COLUBER, and that the eyes are, in general, small, and the tail rather obtuse: no poisonous species of Anguis has yet been discovered. To the English generic title, *Slow-Worm*, some objection may perhaps be made, and it is not to be imagined that all the animals of this genus are remarkably slow in their motions; though, from the want of scuta, they perhaps may be allowed to move with less rapidity than the generality of Snakes.

FIG. 1. *Coral Slow-worm. Anguis coralina*, LINN. *Tortrix corallinus*, CUV.

A large and highly elegant species: length about a foot and a half: thickness very considerable: ground-colour pale red, with very broad alternating fasciæ and variegations and deep coral red: the scales are moderately large and of a rounded form, and the head and tail are remarkably obtuse. This beautiful animal is a native of South America, where it is said to be found in woods, and to prey on the larger insects, as scolopendræ, &c. &c.: in colour it sometimes varies, a mixture of black being blended with the red on the sides, and the bands more numerous in some specimens than in others.

FIG. 2. *Black-banded Slow-worm. Anguis ater*, LINN. *Tortrix ater*, CUV.

Much allied in general appearance to the preceding, but differing in colour, being white with black bands: the abdominal scales, according to Seba's figure, on the authority of which this species is given, are somewhat dilated, so as to approach in some degree to those in the genus *Coluber*. Native of South America.

FIG. 3. *Jamaica Slow-worm. Anguis jamaicensis*, LINN. and CUV.

The length of this species, according to Brown, in his History of Jamaica, seldom exceeds sixteen inches, and the diameter of the animal gradually increases from the snout to the tail, which is extremely short, and terminates in a slightly pointed extremity: it is found about the roots of decayed trees, near ants' nests, &c. and though popularly considered as poisonous, is entirely innocuous: its colour is a uniform pale brown, with a kind of silvery gloss on the scales, which are extremely smooth, resembling in some degree those of the Scink.

PLATE CLXIV.—ICHTHYOLOGY.

The characters of the Linnean genus SCIÆNA have been mentioned on a former occasion: but those of *Centropomus*, separated by Cuvier from that genus, remain to be noticed, viz. a dentated preoperculum, and an operculum free and unarmed. Only one species is known, which is the

FIG. 1. *Centropomus undecimalis*, CUV. *Sciæna undecimalis*, LINN. Pike. A large and excellent fish, known throughout the warmer parts of America, by the name of Pike. It is of a silver colour tinged with greenish; with a black lateral line.

The genus LABRAX, (also separated from *Sciæna*) has been described in another place, but we add on this occasion a most interesting and familiar species—the

FIG. 2. *Labrax lineatus*, CUV. *Sciæna lineata*, LINN. The Rock-fish of the United States. To this species Dr. Mitchell of New-York, with a singular vanity and disregard for the labours of others, gave his own name, calling it *Perca Mitchelli*, although it had been described and figured for an hundred years.

The peculiar character of the genus GASTEROSTEUS, consists in the freedom of the dorsal spines, which do not form a fin, and in the pelvis being united to humerals larger than usual, and thus furnishing the abdomen with a sort of bony hauberk.

FIG. 3. *Gasterosteus aculeatus*, LINN. and CUV. This is a most abundant fish in Europe, where it is called *Stickleback*. They have even been used to manure land, and feed hogs.

The genus TRACHYCHTHYS of Dr. Shaw, is remarkable for its brilliant and dentated scales, and a small dorsal fin; there is a flat spine on the lower part of the preoperculum, and one on the shoulder; the abdomen and sides of the tail are covered with large carinated scales.

FIG. 4. *Trachychthys australis*, SHAW and CUV. Inhabits the Indian Ocean.

The genus CARANX of Cuvier has a lateral line, more or less mailed with scaly plates or bands, carinated, and frequently spinous. they have two distinct dorsals; the last rays of the second being but slightly connected, and sometimes separated into spinous fins.

FIG. 5. *Caranx rotleri*, CUV. *Scomber rotleri*, LINN. A fish resembling a Herring, and inhabits the Indian Ocean.

The genus LICHIA has free spines on the back, and two others also free before the anal: the body is flat, and in front of the dorsal spines is a single one laid flat, and pointing forwards,

FIG. 6. *Lichia aculeata*, CUV. *Scomber aculeatus*, LINN.

PLATE CLXV.—ENTOMOLOGY.

The genus ÆSTRUS of Linnæus is familiar by the trivial name of *Gad-fly*. The different species are extremely troublesome and even destructive to horses, sheep, and other cattle, depositing their eggs in different parts of the body, and producing painful tumours, and sometimes death. The larvæ are without feet, short, thick, soft and annulate, and often furnished with small hooks: these larvæ are called *botts*; but, in their perfect state, are a kind of *fly*, as shown on the annexed plate.

Their antennæ are very short; each one is inserted in a fossula over the front, and terminated by a rounded palette. But

these insects are rarely observed in their perfect state, the time of their appearance and the localities they inhabit being very limited. As they deposit their eggs on the bodies of various herbivorous quadrupeds, they must be sought in woods and pastures. Each species of œstrus is usually a parasite of some one species of mammiferous animal, and selects for the deposit of its eggs the part of its body that is suitable for that purpose. The Ox, Horse, Ass, Reindeer, Stag, Antelope, Camel, Sheep and Hare are the only quadrupeds yet known which are infested by the larvæ of this insect; and they seem to have an instinctive dread of the buzz of the œstrus as it approaches them to deposit its eggs.

The domicil of the larvæ is of three kinds; and we may distinguish them by the names of *cutaneous*, *cervical*, and *gastric*, as some live in tumours formed in the skin, others in some part of the head, and others in the stomach. The eggs that produce the first variety are deposited by the female under the skin by means of a scaly *ovipositor*, composed of four tubes fitting one within the other, and armed at the end with three hooks. They are hatched in the tumours they occasion, and live on the purulent secretions excited by their presence.

The ova of the other Œstri are simply deposited on and attached to various parts of the skin, especially on those parts habitually licked by the animal, in order that they may be conveyed on the tongue to the internal parts. Thus the female *œstrus ovis* places her eggs on the internal margin of the nostrils of the sheep, which is no sooner aware of it than it becomes agitated, strikes the earth with its feet, and runs with its head to the ground. The larvæ insinuate themselves into the frontal and maxillary sinuses, and cling to the living membrane of those cavities.

The *Œstrus equi*, (Horse œstrus) deposits her eggs at intervals, (without alighting, and by balancing her body in the air) on the legs, shoulders, and withers of the Horse. The *Œstrus hæmorrhoidalis*, which infests the same animal, lays its eggs on his lips. The larvæ cling to the tongue, and are conveyed into the stomach, but are rarely found in the intestines: they are often suspended in the former in vast clusters, and are called *bots*.

Both species of Horse Bots, having acquired their growth, leave their abode and fall to the ground, in which they conceal themselves, in order to assume the pupa state. Those which inhabit the stomach follow the track of the intestines, and escape through the anus. The metamorphosis usually occurs in June and July.

M. de Humboldt met with Indians in South America, whose abdomen was covered with little tumours, produced, as he supposed, by the larvæ of an Œstrus: more recent observations corroborate this opinion; and Mr. Say has at length seen and examined an individual insect of this species, which he calls *œstrus hominis*, or the *human œstrus*.

Fig. 1. & 2. Œstrus equi. *Horse œstrus.* Male and female.

Fig. 3. Œstrus bovis. *Ox œstrus*, or Gad-fly.

Fig. 4. Œstrus ovis. *Sheep-œstrus.*

The following is extracted from Professor Rennie's History of Insects:—

What the gall-fly does to a plant, the gad-fly (*œstrus*) does to our cattle: it deposits its egg under the skin of the animal, and thus gives rise to what may be justly termed an animal gall. These tumours are to be found most frequently on young and well-fed calves; and far from being any drawback in the estimation of the purchaser, cattle-breeders prefer those animals in which they exist, being well aware that the instinct of the parent insect causes it to place its young only where its food is most abundant—that is, under the skin of such of our cattle as are full of juices and health. The tanners also prefer those skins which abound in bot-holes, because they are the thickest and strongest. As soon as the worm has quitted the egg, it finds itself in a nest, which affords it shelter, food, and an equal temperature in all seasons.

The egg, having been introduced, gives rise to a tumour, which gradually enlarges with the growth of its inhabitant: during this period the hole perforated by the insect to deposit its egg, so far from closing, becomes wider. The bot, or worm, requires a constant supply of fresh air; and its stigmata, situated at its posterior extremity, are constantly applied to the orifice. In this it acts like a skilful surgeon, who desires to keep an issue open; for the application of its tail to the orifice keeps up the irritation and prevents its closing. Not only must there be an opening for the admission of the air, but, as the bot subsists on the pus which arises from the interior of the tumour, if there were no outlet for the excess, its too great accumulation would convert the nest into an abscess, in which the animal, instead of being nourished, would be destroyed.

When it has acquired its full growth, its old habitation becomes unfit for its approaching metamorphosis; accordingly, it dilates the orifice of the tumour, by using its own body in the same manner as a surgeon applies a sponge-tent. It thrusts a ring or two through the hole, and then withdraws them, and so on, until it crawls out backwards. This operation, according to Reaumur, is usually completed in the cool of the morning. The worm, having escaped from its den, rolls off the animal on which it has fed, and falling on the ground, seeks the shelter of some fissure, or stone, and there its own skin hardens into a black cocoon, within which it undergoes its last change, when it comes out a perfect insect.

Other species of the *œstrus* infest the intestinal cavity of the horse. The *œstrus equi* is found in its stomach; the parent insect deposits its egg about the shoulder of the horse, where it can be easily reached by the tongue; the irritation causes the animal to lick the part; and by this means the bot is introduced into the only place which affords the viscid nutriment and due heat requisite for its full development.

The *œstrus hemorrhoidalis* chooses the anal extremity of the horse to deposit its egg. According to Clarke, the egg is deposited on the edge, and the larva creeps through the whole length of the intestines. Dr. Gaspari saw the perfect insect hover about one of his horses, apparently for the purpose of laying its egg: its attempts caused the animal to plunge, kick, and run, and, in short, excited that furor, which induced the ancients to give these insects their designation of *œstrus*. Not being successful, the creature insinuated itself with less noise under the tail of another horse which was feeding quietly by itself. Its attack seemed at first to excite itching, and the fly profited by the irritation thus produced to effect a lodgement. Soon after this happened, the horse ran about, plunged, and then threw himself on the ground; and did not recommence feeding until after the lapse of a quarter of an hour. The worm is provided with hooks, by means of which it retains its place. It also, when sufficiently developed, falls off the horse, and, like the œstrus bovis, undergoes its metamorphosis on the ground.

A third species of œstrus is found in the nostrils of sheep, goats, and various other animals. The egg is lodged in the frontal sinus, in the midst of the mucus which they contain.

"In Lapland," says Linnæus, "there is a fly covered with a downy hair, called the reindeer gad-fly; it hovers all day over these animals; their legs tremble under them, they prick up their ears, and flee to the mountains covered with snow and ice; with so much horror do they avoid so minute an insect hovering in the air. This fly endeavours to lodge its egg on the back of the deer, which being effected, the worm perforates the skin, remains under it the whole winter, and in the following year becomes a fly.

Although Linnæus has attributed the perforation of the skin to the larva, it is probable that the same process which has already been detailed in treating of the œstrus bovis, is also followed by this species. But another kind of œstrus lodges near the gullet of the deer, and there the larvæ take up their abode in families consisting of one hundred or more individuals. At each side of the root of the tongue, there is, according to Reau-

ENTOMOLOGY

Order Coleoptera

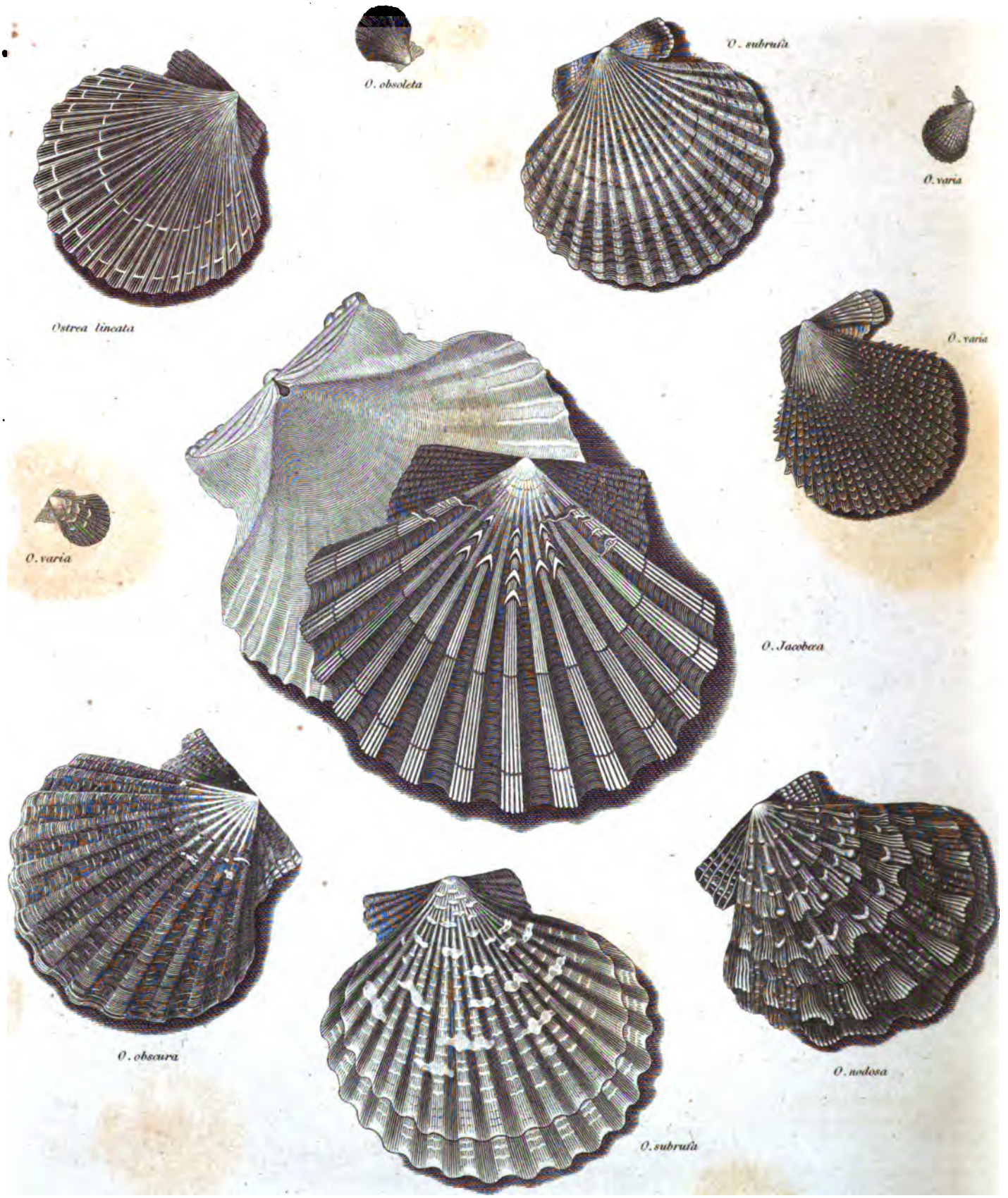
GENUS *CICINDELA*.



1 C campestris
2 C sylvatica
3 C flexuosa
4 C ornata
5 C capensis
6 C littoralis

7 C germani
8 C riparia
9 C paludosa
10 C aquatica
11 C ilaripes

* Magnified under sam


O. obsoleta
O. subrufa
O. varia
Ostrea lineata
O. varia
O. varia
O. Jacobæa
O. obscura
O. nodosa
O. subrufa

near, a slit, in the pharynx or gullet of the deer, which leads to two fleshy cavities, which he calls purses. We do not know, says he, of what use they are to these large animals, but they are essential to the worms which are developed within them. If they are not made for these, if they are useful to the deer, at all events, he who constructed the cavities, and formed the insects, knew that they were necessary to the existence of these worms, and so taught them to lodge in their destined repositories; for all that is essential to their nourishment and growth is contained within these, and is not to be found elsewhere. The question is, how the perfect insect contrives to deposit its young in a spot which none but an anatomist can detect, and to reach which requires the boldness and dexterity of a creature which is regardless of its own life. If we consider that nature has endowed the deer with the power of ejecting any substance annoying the nostrils, by sneezing—the power of enveloping any thing irritating the palate in a viscid saliva, or crushing it by means of grinder-teeth, we must give due credit to a fly which, in spite of these obstacles, manages to reach the cavities in question. If, however, we recollect the boldness with which the œstrus of the horse enters the intestine of that animal, we shall not be astonished to find that a fly, as full of care and foresight for its young, should with equal courage enter the nostrils of the deer. According to Reaumur, the creature boldly walks into the cavities, and proceeding to the extremity, comes at once on the fleshy purses at the root of the tongue: in these the female fly deposits her eggs, and leaves them in a matrix furnished with a supply for every want.

Humboldt, Bonpland, and Gmelin have discovered a species of gad-fly which attacks man. It is a native of South America, and is about the size of a common house-fly. It deposits its egg under the skin of the abdomen, where it forms a swelling of the nature of that on oxen, and other animals, in which the grub remains for six entire months. If molested, it sinks deeper and deeper, and creating ulcers or inflammation, often causes death.

The Linnæan genus TIPULA belongs to the order Diptera, and has the following characters: the mouth has a very short proboscis, membraneous, canaliculated on the back, receiving a bristle; the haustellum short; the feelers two, incurved, equal, filiform, longer than the head: antennæ mostly filiform. M. Latreille and other naturalists have greatly subdivided this genus.

FIG. 5. *Tipula rivosa*, LINN. and LAT. Inhabits Europe.

FIG. 6. *Tipula hortorum*, LINN. and LAT. Inhabits Europe.

FIG. 7. *Tipula variegata*, LINN. and LAT. Inhabits Europe.

FIG. 8. *Tipula crocata*, LINN. and LAT. Inhabits the north of Europe.

FIG. 9. *Tipula punctata*, LINN. and LAT. Inhabits Upper Austria.

FIG. 10. *Tipula atrata*, LINN. and LAT. Inhabits Europe.

FIG. 11. *Tipula plumosa*, LINN. *Chironomus plumosus*, LAT. Inhabits the marshes of Europe.

FIG. 12. *Tipula pectinicornis*, LINN. *Ctenophora pectinicornis*, LAT. Inhabits moist places throughout Europe.

FIG. 13. *Diopsis ichneumonea*, LINN. and LAT. Inhabits Bengal, Angola, and other provinces of Asia.

PLATE CLXVI.—ENTOMOLOGY.

The genus CICINDELA of Linnæus, is mostly seen in dry, sandy places, and in none more abundantly than in arid tracts of land on the sea-shore. They are extremely voracious, and prey on every other species of insect they meet with. The larvæ are furnished with six feet, and have a scaly head: they live chiefly under ground, and lurk in a round, perpendicular hole, waiting for their prey. When arrived at the perfect state of insect growth, they are remarkably beautiful and varied.

FIG. 1. *Cicindela campestris*, LINN. and LAT. Inhabits Great Britain.

FIG. 2. *Cicindela sylvatica*, LINN. and LAT. Inhabits England.

FIG. 3. *Cicindela flexuosa*, LINN. and LAT. Inhabits the coast of Spain.

FIG. 4. *Cicindela sinuata*, LINN. and LAT.

FIG. 5. *Cicindela capensis*, LINN. and LAT. Inhabits the Cape of Good Hope.

FIG. 6. *Cicindela littoralis*, LINN. and LAT. Inhabits the shores of Barbary.

FIG. 7. *Cicindela germanica*, LINN. and LAT. Inhabits Europe.

FIG. 8. *Cicindela riparia*, LINN. *Elaphus riparius*, LAT. Inhabits Europe.

FIG. 9. *Cicindela paludosa*, LINN. *Bembidium paludosum*, LAT.

FIG. 10. *Cicindela aquatica*, LINN. *Notiophilus aquaticus*, LAT. Inhabits Europe.

FIG. 11. *Cicindela flavipes*, LINN. *Bembidium flavipes*, LAT. Inhabits Europe.

PLATE CLXVII.—CONCHOLOGY.

Linnæus placed all the *Pectens*, or *Scallops*, in his great genus OSTREA, from which Bruguière very properly separated them, although the hinge is the same in both. But the Pectens are readily distinguished by their semicircular shell, which is almost always ribbed, and furnished with two angular projections called *ears*, which widen the hinge margin. Few shells surpass the Pectens in beauty or variety of colour, and they inhabit every known sea.

FIG. 1, 2, & 3. *Pecten varius*, BRUG. and LAM. *Ostrea varia*, LINN. Shell inequivalve, with thirty compressed ribs, crossed by prickly scales. Varies in colour from pale red and yellow to every shade of brown. One of the ears is always much smaller than the other. It is common in the seas of Europe.

FIG. 4, & 5. *Pecten subrufus*, BRUG. and LAM. *Ostrea subrufa*, LINN. Shell with twenty smooth ribs, the interstices being transversely striated. This species is about two inches in diameter. It inhabits the British coast.

FIG. 6. *Pecten lineatus*, BRUG. and LAM. *Ostrea lineata*, LINN. With about twenty strong ribs, which are longitudinally striated, and decussated by several white concentric lines.

FIG. 7. *Pecten jacobæus*, BRUG. and LAM. *Ostrea jacobæa*, LINN. Shell with about fourteen angular, striated ribs, the interstitial space being transversely striated. The lower valve is concave, the upper one flat. It inhabits the seas of Europe, and is nearly allied to the well-known *Pecten maximus*.

FIG. 8. *Pecten nodosus*, BRUG. and LAM. *Ostrea nodosa*, LINN. Shell with nine or ten strong ribs, covered with seemingly vesicular tubercles. Its colours are various shades of red and brown. It inhabits the West India islands, and the coasts of Florida and Mexico.

FIG. 9. *Pecten obscurus*, BRUG. and LAM. *Ostrea obscura*, LINN. Shell with twelve strong ribs, crossed, together with the intervening spaces, by distinct, rough stria. The ears are nearly equal, and the valves compressed.

FIG. 10. *Pecten obsoletus*, BRUG. and LAM. *Ostrea obsoleta*, LINN. Shell nearly smooth, of a dark purple colour, with eight or ten fasciculi of radiating stria: ears very unequal and wrinkled. Inhabits the coast of Great Britain.

PLATE CLXVIII.—MOLLUSCA. (*Vermes*, LINN.)

The genus ONCHIDIUM has a broad fleshy mantle, in the form of a shield, overlapping the foot at all points, and even covering the head when it contracts: two long, retractile tentacula, and on the mouth an emarginated veil, formed of two depressed lobes. These animals are destitute of jaws, but have a muscular gizzard, followed by a double membranous stomach. The body is externally tuberculous. These animals belong to the class *Gasterpoda* of Lamarck and Cuvier.

FIG. 1. *Onchidium typhæ*, BUCHAN. and CUV. In appearance it resembles a slug; the body is ash-coloured, and covered with glandular tubercles. It inhabits Bengal, feeding on the *Typha elephantina*.

The genus APLYSIA (often but erroneously written *Laplysia*) has the margin of the foot turned up into flexible crests, surrounding the back, and even susceptible of being reflected over it. The head is supported by a neck, and the ears are excavated like those of a quadruped. The branchiæ are on the back, and consist of highly complicated lamellæ attached to a broad membranous pedicle, in the thickness of which is a flat and horny shell.

FIG. 2. *Aplysia depilans*, LINN. and CUV. It is of a blackish colour, with large grayish, clouded spots. The figure annexed is partially dissected, to show the shell within the body of the animal.

The genus DORIS, of Cuvier, has an anus opening on the back, the branchiæ being arranged around it in a circle. The mouth has a small proboscis, furnished with conical tentacula. Two other horn-like tentacula arise from the upper part of the mantle.

FIG. 3. *Doris argo*, LINN. and CUV. Body oval, red, with black dots, and two feelers at the mouth: vent surrounded by a yellowish ramified fringe. It inhabits the seas of Europe.

FIG. 4. *Doris radiata*, LINN. *Glaucus radiatus*, CUV. Of a silvery blue colour, with lateral, extensile, fasciculated branches. Inhabits the West Indian seas.

FIG. 5. *Doris papillosa*, LINN. *Eolidia papillosa*, CUV. With lateral filiform appendages. Dorsal line smooth. Inhabits the seas of Europe.

The Linnæan genus APHRODITA is characterized by an oblong body covered with scales, and numerous bristly feet: the mouth is terminal: it has two feet and four eyes.

FIG. 6. *Aphrodita aculeata*, LINN. and CUV.

FIG. 7. *Aphrodita squamata*, LINN. *Eumolfe squamata*, CUV.

PLATE CLXIX.—VEGETABLE ANATOMY.

FIG. 1, 2, & 3. illustrate the bifurcation of the trunk of a tree. FIG. 3. represents the transverse section, first assuming an elliptical form, having two distinct centres, each surrounded by a few of the concentric layers of annual growth. In FIG. 2. which is a section made nearer the point of bifurcation, these centres are observed to have diverged, and the concentric layers appearing as rings, become more numerous, until they are all included, when the fork appears externally, as at FIG. 1.

FIG. 4. is a longitudinal section of a trunk having a lateral branch, and further illustrates the manner in which the layers of annual growth are prolonged into the branch.

FIG. 5. is a longitudinal section of a spine, illustrative of their being in fact abortive or undeveloped woody branches.

FIG. 6. gives a front view of a small branch, and of the manner in which the bark of the main trunk is separated by its gradual increase.

FIG. 7. a distorted branch given off from a trunk that has been split, or suffered some mechanical injury.

FIG. 8. a young trunk in which some of the vessels or fibres have been partially separated.

FIG. 9. is a branch whose growth has been checked for a series of years, as manifested by the numerous cicatrices of leaves forming the rough and enlarged portion.

FIG. 10. a branch with two opposite buds (*b*, *b*).

FIG. 11. is a bud with part of the supporting branch, in which is seen very plainly the cicatrix produced by the fall of a leaf.

FIG. 12. longitudinal section of the preceding, in which the young included shoot (*c*) is plainly seen.

FIG. 13. the scales of the bud have been removed, leaving the young shoot alone. The cicatrix of a fallen leaf is represented on the middle of the branch.

FIG. 14. the longitudinal section of a flower-bud, representing the pistil (*d*), and the mode in which the anthers are packed (*c*, *c*).

FIG. 15. is the outer hairy envelop of the preceding bud.

FIG. 16. the same flower-bud in its young state.

FIG. 17. the same flower-bud, farther advanced, and commencing to expand.

FIG. 18, 19, & 20. represent *bulbs*, FIG. 18 being a transverse section, and 20 a longitudinal one. The analogy to buds is seen, for they are in fact only radical buds; and the scales in both instances consist of abortive or undeveloped leaf-stalks. FIG. 19 is called by some botanists a *scaly bulb*, merely because these leaf-stalks are narrower and more numerous. The real roots are seen attached below.

Growth of Wood.

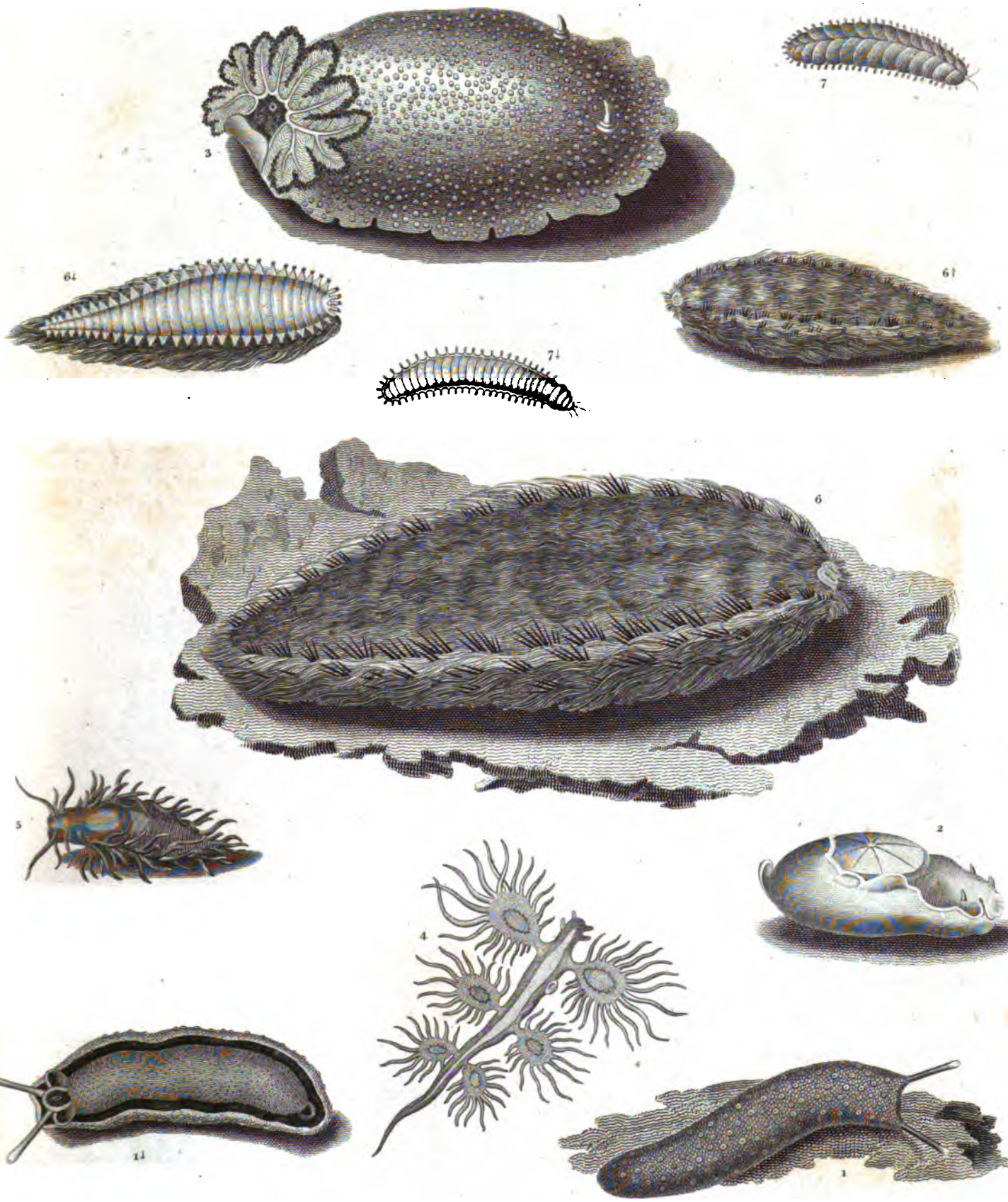
The texture of the Wood which constitutes the great mass of trees and shrubs, was investigated with peculiar care by Duhamel, and the same subject has been more recently pursued by Mirbel and Knight, with their usual ingenuity and success.

An old stem of the Currant, when transversely divided, exhibits a series of concentric layers intersected by plates which diverge from the pith to the bark, like the rays of a circle. A tranverse section of the Oak presents a similar arrangement, but here the circular layers are considerably thicker and the divergent plates far more conspicuous than in the preceding example. And if we would pursue the examination still farther, the Ash, the Elm, and the Lilac, will serve to show that the arrangement so obvious in the Oak, prevails also in other woody stems. The central layers are usually most durable and complete, for those of the circumference being still under the control of a living principle, retain a portion of their peculiar juices, which can be suddenly dissipated only by the application of heat.

It is ascertained that each of the concentric layers is the growth of a single year, and that the age of a tree may be known by the number of circular layers which compose its trunk. It has even been asserted that we may know what winters have been peculiarly severe, by the hardness of the annual plates, and what summers have been mild and serene by their superior thickness.

After it was ascertained that a new layer is annually deposited, it became a question whether it was formed by the bark, the wood, or, according to the speculations of Linnæus, from the pith. But the experiments of Duhamel and Hope have put this question for ever at rest. The former introduced plates of tinfoil between the bark and wood of growing trees, carefully binding up their wounds, and suffering them to remain several years without further molestation. He found, in all cases, the layers of new wood exterior to the tin.

Dr. Hope's experiment is equally decisive. He made a lon-



1. O. typhæ _ 2. L. depilans _ 3. D. argo _ 4. D. radiata _ 5. D. papillosa _ 6. A. aculeata _ 7. A. squamata

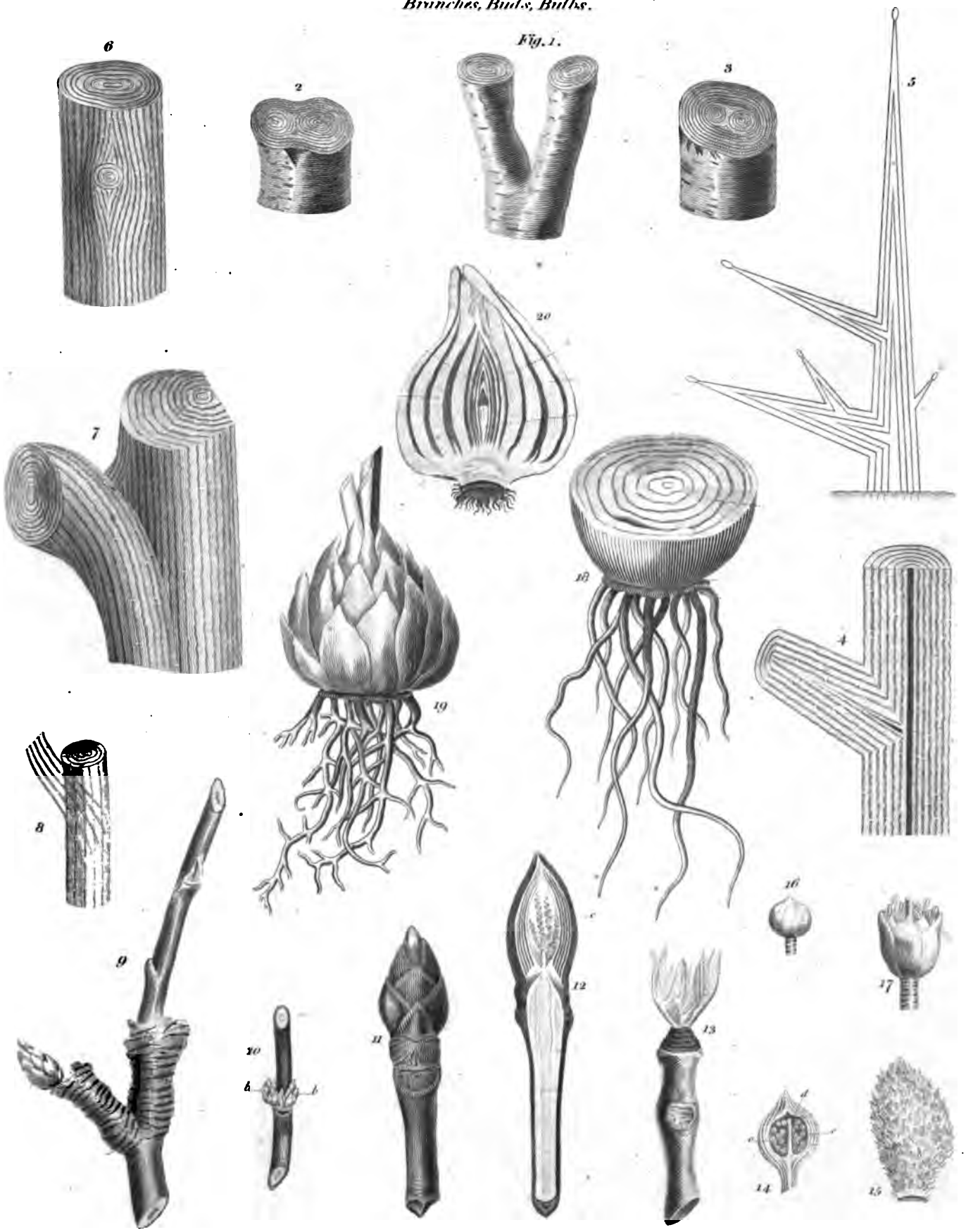
† *under surface* ‡ *young*

1. *LINNEAN* O. _ 2. *SEA-HARE* _ 3. *SEA-LEMON* _ 4. *RADIATED* D. 5. *PAPILLOUS* D. _ 6. *SEA-MOUSE* _ 7. *SCALY-SEA-MOUSE*.

VEGETABLE ANATOMY.

Branches, Buds, Bulbs.

PLATE 169



I.Draper fc.

gitudinal incision on the branch of a Willow, so as to detach the wood from the bark, leaving the latter in the form of a hollow cylinder, by the side of the naked stem, and both portions retaining their original connexion with the trunk and superior branches. After a few years this tree was examined, and "the cylinder of bark was found lined with layers of new wood, whose numbers, added to those of the wood from which it had been stripped, made up the number of rings in the branch above and below the experiment." But the stem from which the bark had been removed remained unaugmented. It appears therefore that two layers are annually deposited on the inner surface of the bark, similar at first and closely united, but gradually assuming a distinct character, and at last receding from each other in the form of wood and bark. At the commencement of a second spring, they are contiguous but readily detached from each other, but ever afterwards they are separated by the intervention of the more recent layers.

Of Bulbs. Bulbs are by some writers classed with roots, while others regard them as an interesting variety of subterranean bud. Certain it is, that they inclose the embryo of future plants, till the period of their evolution arrives, and in this respect they perform the office of buds. Many of them are also composed of concentric scales, nearly allied to those which secure the tender leaves and flowers of northern trees, from the cold of the winter to which they are exposed. But it is equally true that they bear a close analogy to the tuberous root, and whatever opinions we adopt respecting their nature and rank, whether we class them with roots or with buds, the plants to which they are attached will always be regarded with peculiar interest. They are amongst the earliest harbingers of spring, and certainly the most splendid ornaments of the garden. Among them are the Lily, Snowdrop, Tulip, Hyacinth, with about forty more interesting plants, equally deserving the fostering care of the cultivator. While examining the internal arrangement of these roots even at mid-winter, we cannot fail to observe with what care the plants of another season, already conspicuous and perfect, are preserved from injury. From their inferior surface, radicles descend into the earth, which, like the fibrous extremities of other roots, are designed for the immediate absorption of nourishment. The bulbs are evidently designed to preserve the living powers of the plant, and to supply it with sustenance when its other resources are exhausted. Their structure would lead to this opinion, and their habits would confirm it. Thus the root of the common Herds-grass, *Phleum pratense*, when growing in pastures that are uniformly moist, is merely fibrous; but in dry situations, or such as are occasionally wet, it becomes bulbous, and thus secures a store of nutriment by which its vital powers are supported, while the fibrous roots are deprived of their usual supplies. If once more transferred to a soil uniformly and thoroughly moist, it again becomes fibrous and resumes its former luxuriant growth. In this case it has been supposed that "the herb being in the first instance starved, by a failure of the nutrimental fluids hitherto conveyed by the water of the soil, its growth would be checked, and when checked, the same growth could not, as we know by observation on vegetation in general, be instantaneously renewed. A sudden fresh supply of food would therefore cause an accumulation of vital energy in the root, which would consequently assume a degree of vigour and a luxuriant mode of growth not natural to it, and become bulbous. Thus it acquires a resource against such checks in future, and the herb is preserved alive, though in a very far less luxuriant state than when regularly and uniformly furnished with its requisite nourishment." And accordingly we see that those plants which in their native situation find only a precarious supply of water, are supplied with bulbous roots for their preservation. Like the thick-leaved plants, many of them were brought from Africa, and their texture is happily designed to encounter the privations of those countries which they are intended to adorn.

Nearly allied to bulbs are the tuberous roots which consist of a single knob, or of several, connected by intervening radicles. These knobs preserve the vital energy as well as the nutritive fluids which they receive from the leaves of their respective plants, till the former is aroused into action, and the latter are demanded for use. Like that of the alburnum, their growth depends on the renovated sap, which has passed and repassed through the vessels of the stem. We see therefore the intimate connexion betwixt the leaf and the root, and perceive why the luxuriance of the one should indicate the comparative size and fruitfulness of the other.

Of Buds. About mid-summer the progress of vegetation seems to be suspended, and for several days the vital energies of the tree are exerted in the formation of buds. We no longer observe the vigorous growth of spring, but if we examine the young branches, we shall find the newly formed buds at the base of the leaf-stalk, immediately above the place of their insertion. After the fall of the leaves, they are more conspicuous, and during the winter we may perceive a gradual enlargement, corresponding to the development of the tender germs which they inclose. Their situation, like that of the leaves, is either alternate or opposite, there being in the former case a solitary bud at the summit of the branch, and in the latter three terminal buds, the central one being larger than the others. Their form is not unlike that of a pear, and their organization exhibits a happy combination of utility and beauty, well meriting the attention of the student. On their exterior surface we find a series of concave scales, inclosing each other like the tiles of a house. The outer of these are hard and dry, the other more delicate, and resembling in their texture the leaves which they inclose. These scales are frequently connected together by a resinous substance, which water is unable to penetrate, and this armature is particularly obvious on the large buds of the Horse-Chestnut. Having removed the scales, we find the leaves or flowers, or perhaps both, inclosed in down, which like the fur of animals is designed as a security against the influence of cold.

The buds of the Walnut and Horse-Chestnut are unusually large, and the examination of either of these will enable us to form an accurate idea of their general structure and use: one of the latter was dissected by a German botanist for whose patience we have great respect, at the time when it did not exceed the size of a pea. He found it covered externally by about twenty scales, which were cemented together by the resinous adhesive substance so conspicuous in the buds of that tree. Within the scales he found the embryo enveloped in down, and pursuing the inquiry he distinctly saw twenty-eight leaves surrounding a spike of sixty flowers. The scales, resin and down, all conspire to produce the same effect, though the first appears particularly designed to guard against external injury from birds and animals, while the down serves as a protection from cold and the resin from moisture and air.

United, they enable the tender embryo to brave the vicissitudes of a northern climate, and protect it from other injuries till the period of expansion arrives. In the northern section of the United States, we find but few trees or shrubs capable of enduring the cold of winter without this security.

In Sweden we are told there is but one shrub destitute of buds, and that, from the peculiarity of its situation, is always protected from the inclemencies of the Swedish winter. But in warmer climates, the tender shoots do not require this protection, and accordingly, we find that the Orange, Lemon and Mimosa, and other shrubs, natives of tropical regions, are not furnished with the "winter cradles" of northern plants. If they are, whatever may have been their natural situations, whatever may be the degree of heat to which they have been accustomed, they will probably endure the cold of our winters, and flourish without protection in the open air.

PLATE CLXX.—QUADRUPEDS.

Class Mammalia. Order Bellvæ. Genus Sus Hog.

Generic character. The incisory teeth are $\frac{4}{4}$, or $\frac{6}{6}$; the canine teeth are $\frac{1}{1}$; the grinders are $\frac{7}{7}$; total 38. The lower incisory teeth are directed obliquely forward; the upper canine teeth increase in size during the whole life of the animal, growing out of the mouth; the grinders are simple and tuberculous; all the feet have four toes, the two middle ones only touching the ground; the nose is elongated, cartilaginous, and furnished with a particular bone to the snout; the body is covered with a thick skin, having strong bristly hairs. They have twelve teats.

Fig. 1. *Wild Hog. Sus Scrofa.* Variety *Afer*, Linn. and Cuv.

The wild boar is the original from which all tame varieties of the hog have sprung. It is not subject to the variety of the domestic races, but uniformly of a brindled or dark gray, inclining to black. His snout is longer than that of the tame hog, and his ears are short, pricked, round, and black. He is adorned with formidable tusks in each jaw; these serve him for the purpose of defence as well as for digging his food, which chiefly consists of roots and vegetables. Some of these tusks are nearly a foot long, those in the upper jaw bending upwards in a circular form, and are exceedingly sharp at the points; those of the under jaw are, however, always most to be dreaded, for with them the animal defends himself, and frequently gives mortal wounds.

Wild boars are not gregarious; they live generally apart from the females, except in the rutting season. The females, with their young, form immense herds, for mutual defence. If they are attacked, the females always appear in front, squeezing themselves into a compact line, with the young in their rear.

The pursuit of the wild boar is a favourite pastime with the Germans. It is attended with great danger; its large tusks rendering it not only formidable to the dogs, but also to the hunters. The dogs chiefly used for this sport, are of a strong heavy kind. When the boar is roused from his lair, he proceeds slowly forward, and does not attempt to make great head of his pursuers; on the contrary, he frequently turns round, waits till they come up, and offers to attack them. Dogs are not rash to assault the animal; and after keeping each of them at bay for some time, he again breaks slowly away, and the pursuit is renewed. The chase is continued in this manner till the boar gets tired, and halts; the dogs then attempt to close with him from behind. If the dogs are young and inexperienced, their temerity often costs them their lives; the old ones merely keep him at bay till the hunters come to their assistance, who dispatch the boar with their spears.

The rajahs of some of the northern provinces of India have a very unmanly mode of shooting the wild boars: They build little clay citadels on the brow of a hill, at the foot of which a quantity of food is scattered every evening. The voice and person of the man who feeds them are at length recognized by the boars, and, on his retiring to a little distance, they take their evening meal with considerable confidence. The rajah conceals himself in his little fortress, and, placing the muzzle of his fowling-piece at a small hole in the wall, takes a deliberate aim at his unsuspecting prey, and kills them.

This animal seeks his food in the evening, and frequently commits great devastation in cultivated fields which are contiguous to his native forests. When pressed with hunger, he will attack, and prey upon animals.

The wild boar inhabits Asia, Africa, Europe, and America, but has not been yet discovered in New Holland. They are amazingly plentiful in the extensive forests of Germany; and frequent the most retired situations.

Singular Pet.—M. De Dieskau captured a wild boar, which was nearly three years of age, and which he rendered so tame, that it would go up stairs to his apartment, fawn upon him like a dog, and eat from his hand. He also endeavoured to bring up one which he caught very young. This animal formed an attachment to a young lady in the house, accompanied her wherever she went, and slept under her bed. Upon one occasion, the animal seemed to take offence at the servant of this young lady for undressing her mistress, and made a furious attack upon her, and, had he been strong enough, would have done her a serious injury. This lady was the only person for whom the boar exhibited the least affection; and, what was strange, he was never fed by her. M. De Dieskau became attached to a tame fox, which he brought to the house: the boar took the attention shewn to the fox so much to heart, that he fretted himself to death.

Fig. 2. *The Babyrussa. Sus Babyrussa*, Linn. and Cuv.

This animal inhabits the Indian islands, but its habits are little known to naturalists; and this is the more singular, as it has been long discovered. It is certainly the animal mentioned by Pliny, in his eighth book, chapter third. Ælian also speaks of one under the name of τετραχερως, (four-horned); and Cosmes, in his *Description of the Animals of India*, describes it under the name of χοιρελαφος, or swine deer, and says he had both seen and eaten of that species.

The most distinguishing character of the babyroussa consists in its four tusks, the two strongest of which proceed from the under jaw, like those of the wild boar, pointing upwards, and standing nearly eight inches out of the sockets; the other two rise up like horns on the outside of the upper jaw, just above the nose, and extend in a curve over the eyes, almost touching the forehead, and are fully twelve inches in length. These tusks are of the most beautiful ivory, but not so hard as those of the elephant.

The form of this animal is not so clumsy as those of the other species of the genus; its legs are longer, its body more slender, and covered with a kind of short wool-like hair, of a reddish ash colour; the skin is thin, beneath which is a coat of lard, and the flesh is said to be extremely palatable.

The sense of smelling in this animal is very acute, and its voice resembles the grunting of a pig. When hunted, it flies to the sea, and, being an excellent swimmer, it passes from one island to another in the Indian Archipelago.

No perfect specimen of this quadruped has yet reached Europe, or America.

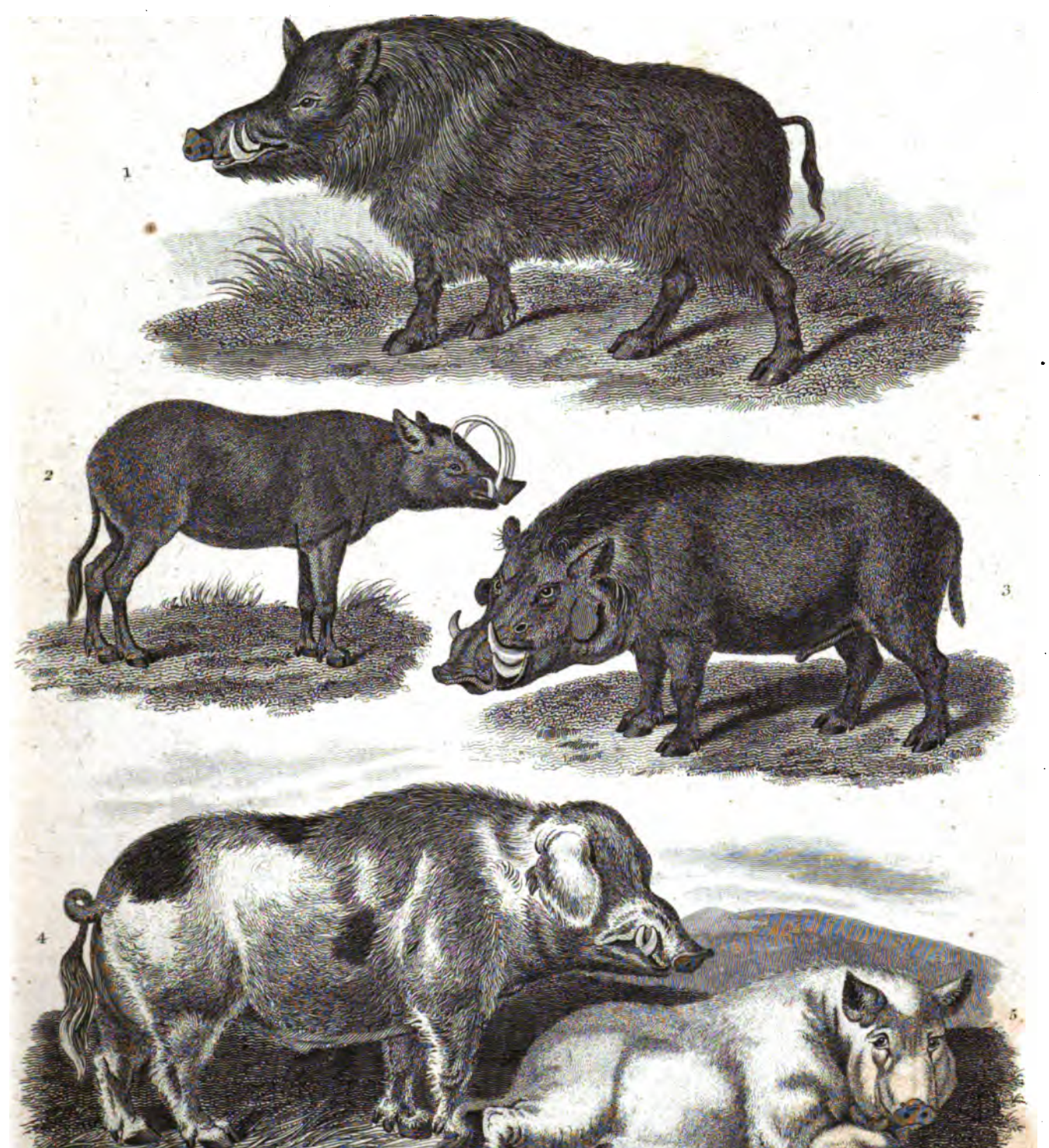
Fig. 3. *Æthiopian Hog. Sus Æthiopicus*, Linn. *Phacochærus Æthiopicus*, Cuv.

The skin of the Æthiopian hog is of a bright yellowish fawn colour; its nose broad, flat, and of a horny hardness; the head is large in proportion to the size of the body; underneath each eye it has a great lobe, or wattle, lying almost horizontally, broad, flat, rounded at the end, and placed so as to intercept the view of any thing immediately beneath it; the ears are large, short, pointed, and erect, lined in the inside with long, whitish hairs; its tail is slender and flat, and, when pursued, the animal always holds it erect; it has a mane of considerable length, commencing at the top of the neck, and terminating near the loins.

This species lives in holes under the ground, the avenues to which are very narrow. It is very dangerous to attack them in these retreats, as they frequently rush out with the most terrible impetuosity, inflicting tremendous wounds on their adversaries.

Figs. 4 and 5. *Domestic Hog. Sus Scrofa*, Linn

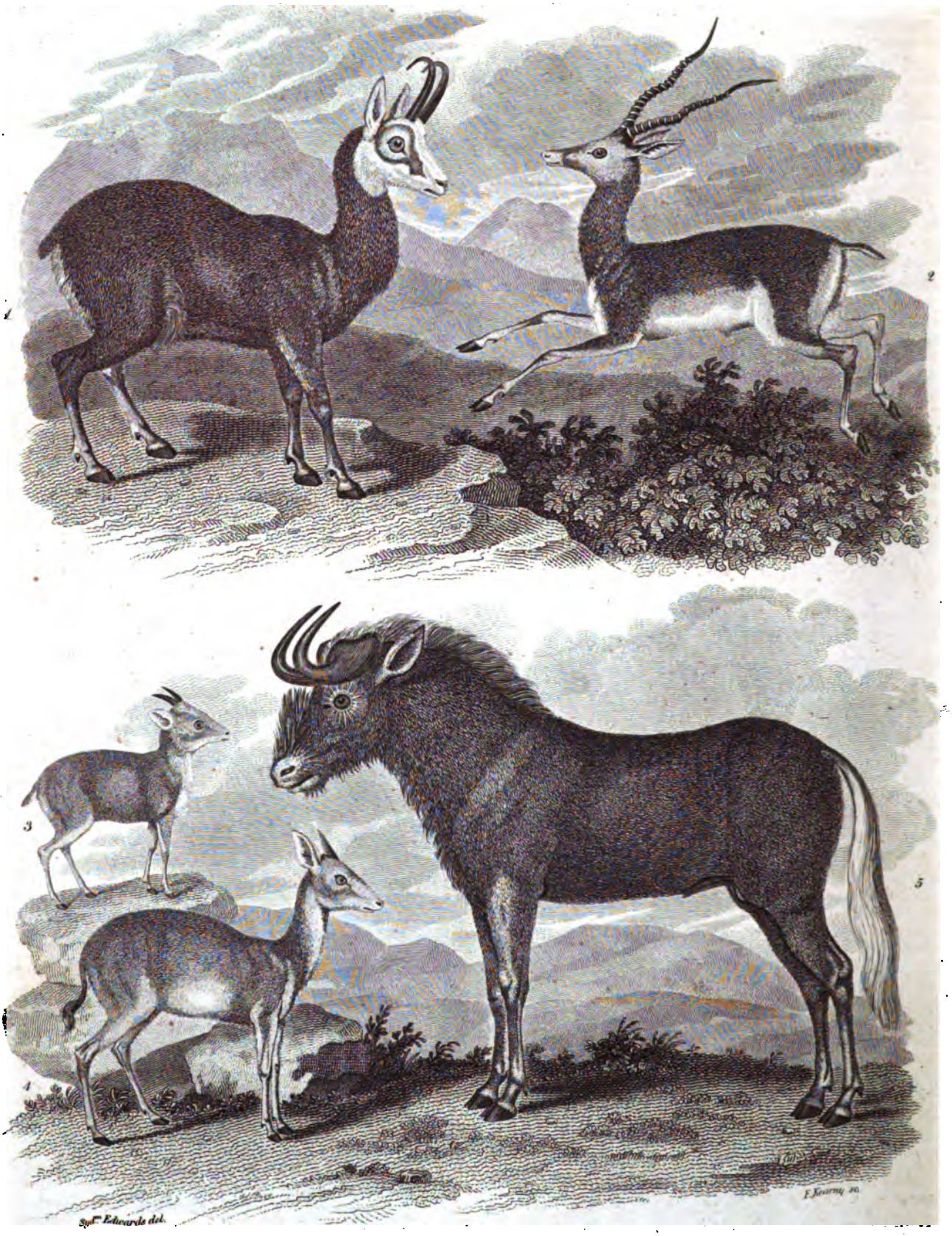
This well-known quadruped is a descendant from the wild boar. It presents a great variety of form, proceeding from domestication and food, as well as an admixture of foreign breeds.



1.S.Scrofa Wild Hog. — 2.S.Babyrussa Babyroussa. 3.S.Æthiopicus. Æthiopian H. — 4.5.Domestic H.

QUADRUPEDS.

CLASS MAMMALIA. GENUS ANTILOPE. ANTELOPE.



1. A. Rupicapra Chamois A.—2. A. Cervicapra Common A.—3. A. Pygmea Royal A.—4 A. Grimmea Guinea A.—5 A. Gnu. Gnou A.

The proportions and gait of the hog are clumsy; the head is heavy; the neck short; the limbs in general are thin in comparison to the size of the body; he goes with his head down, and eyes directed forward. When left at liberty, the hog always resorts to humid, marshy, and muddy places, where he digs for roots and worms; he also feeds on frogs, and will eat the offals of markets, and even putrid flesh, and, not unfrequently, chews bones. His usual pace is a kind of trot. The hog possesses but a limited degree of intelligence; he is easily domesticated, becomes familiar and attached to those with whom he is acquainted, and his feeders. The domestic hog goes with young four months, brings forth usually twice a-year, producing from ten to twenty at a litter

The breed of swine has been much improved of late, by crossing them with the Chinese. They are easier fattened, and greatly more prolific. Instances have been known of a sow producing within the space of ten months, the amazing number of fifty pigs. The following is the produce, with its value, of a sow kept at Drogheda, in Ireland, for nine months:—In July, 1813, she had a litter of eleven, seven of which sold for thirty shillings each, being ten pounds ten shillings: in January, 1814, a litter of nine sold at forty shillings each, making eighteen pounds: in March, three of the first litter sold in the market for thirty-one pounds; and, in April, the sow herself brought twenty pounds five shillings and five-pence: making a total value of seventy-nine pounds fifteen shillings and five-pence: as a breeding sow, one of the first litter was kept, which was worth twenty pounds. Probably, instances of a more profitable kind might be quoted. A sow, the property of George Baillie, butcher in Hospital Street, Perth, on the 22d August, 1829, littered the amazing number of *twenty-nine pigs!*

A sow, belonging to Mr. Thomas Richdale, Leicestershire, had produced, in the year 1797, three hundred and fifty pigs in twenty litters; four years before, it brought two hundred and five in twelve litters. Sauban is of opinion, that in twelve generations a single pair would produce as many as Europe could support.

The hog often grows to an immense size. One was killed on Monday, the 23d March, 1829, belonging to Mr. Lunton, of the Western Inn, Bodmain, which measured nine feet in length, seven feet five inches in girth, and weighed eight hundred and fifteen pounds. It was only twenty-two months old. Some have been known to weigh twelve hundred pounds.

The celebrated Gruyere cheese is said to be made with a mixture of cow's and sow's milk.

In Minorca, the hog is converted into a beast of draught; a cow, a sow, and two young horses, have been seen there yoked together. In some parts of Italy, swine are employed in hunting for truffles, (the *Lycopendor tuber* of Linnæus.) A cord is tied round the foot of the animal, and he is led into the fields where this plant is found, and, wherever he begins to dig, it is a sure sign of the plant being immediately under. The hog possesses the sense of smelling and taste in high perfection. Hogs seem to have a great dread of wind; on its approach, they fly to their sty with great precipitation; and, before a storm, they frequently indicate its coming by carrying straw in their mouths.

The hog is naturally of a savage disposition, and sometimes exhibits marks of great ferocity.

PLATE CLXXI.—QUADRUPEDS.

Class Mammalia. Genus Antilope. Antelope.

Generic character. The incisory teeth are $\frac{4}{4}$; there are no canine teeth; the grinders are $\frac{6}{6}$; total 32. In some species, with horns in both sexes; in others, in the males only; the bony core is solid, round, or compressed; variously inflated, generally with transverse annulations, and longitudinal striæ between them; sometimes bifurcated; in most species the muzzle is partly naked; generally with lachrymal sinuses; the eyes are large and dark; the ears generally long and pointed; the legs are slender, with two or four mammæ.

Fig. 1. *Chamois Antelope. Antilope Rupicapra*, Linn. and Cuv

The Chamois is the only species of Antelope, except the Saiga, that is found in Europe. It is an inhabitant of the Alps of Switzerland and Italy, the Pyrenean mountains, the island of Crete, several parts of Greece, and the mountains Caucasus and Taurus. It is about the size of a common Goat, and is of a deep or dusky rufous-brown colour, with the cheeks, chin, throat, and belly, of a yellowish white: in some individuals the cheeks are observed to be of a dusky colour, and the forehead white. The horns are upright, slender, about eight inches high, and strongly hooked backwards at the tips: their colour is black, and they are slightly wrinkled towards the base, but have no appearance of rings or circular élevations, as in most others of this genus. At the base of each horn, at the back part, is said to be a pretty large orifice in the skin, the nature and use of which do not seem to be clearly understood. The hair of the Chamois is rather long: the tail short, like that of a goat, and of a blackish colour both above and below.

The Chamois is an animal of extremely timid manners, and while the herd is feeding, one always acts as a sentinel, and on every alarm gives notice to the rest by a kind of sharp hiss; upon which the whole herd flies off with the utmost rapidity. They are said to feed chiefly in the very early part of the morning, and in the evening. Their chase is a very laborious employment; since the animals must be approached by surprise, and are shot with rifle-barrelled guns. In their stomachs is often found a species of ægragopila, or hair ball, covered with a hard incrustation. They are said to be long-lived animals, and to bring two and sometimes three young at a time. The skin of the Chamois is greatly esteemed as a fine kind of leather.

Fig. 2. *Common Antelope. Antilope Cervicapra*, Linn. and Cuv.

The common antelope is somewhat smaller than the fallow deer; it is of a reddish fawn colour on the back and upper part of the body and sides, and white below; the insides of the limbs, which are elegantly formed, are white; and, on the outsides, the hair is of a darker shade than on any other parts of the animal; the space occupied by the orbits of the eyes is white; the horns are about sixteen inches long, surrounded with prominent rings almost to the tips; the horns of the antelope are remarkable for a beautiful double flection, which gives them the appearance of the lyre of the ancients; they are of a shining black; the females are destitute of horns.

The whole tribe of antelopes are elegant animals, inhabiting mountainous countries, ranging amid precipices and craggy cliffs, bounding from one to another with astonishing agility. Their food is similar to that of the goat.

The eyes of antelopes are considered perfection in the east, and are always referred to in the songs wherein female beauty is depicted; and are thus beautifully alluded to by Byron in his *Hebrew Melodies*:—

> "The wild gazelle on Judah's hills
> Exulting yet may bound,
> And drink from all the living rills
> That gush on holy ground;
> Its airy steps and glorious eye
> May glance in tameless transport by."

The chase of the antelope is a favourite amusement with eastern nations: they run with great rapidity, and can only be overtaken by greyhounds. They are also pursued in India by the hunting leopard, and even hawks are sometimes used to impede their progress, and allow the dogs to get near them.

Their fleetness has been proverbial from the earliest ages. The speed of *Asahel* is characteristically compared to that of the *Tzebi*, and the *Gadites* were said to be as swift as the antelopes on the mountains. Mr. Pringle says that Tzebi is the African word for the springbok.

FIG. 3. *Royal Antelope. Antilope Pygmea*, LINN. and CUV.

This beautiful and diminutive species appears to have been frequently confounded with the *Moschus pygmæus*, or Pygmy Musk, which it resembles in size as well as in colour and manners. It is a native of the hottest parts of Africa, and is easily tamed, but is of so tender a nature as not to admit of being brought in a living state into Europe. So remarkable are its powers of activity in its native regions, that it is said to be able to leap over a wall of twelve feet high. Its colour is a bright bay, paler beneath, and on the insides of the limbs; and its height not more than nine inches. The horns are straight, short, strong, sharp-pointed, smooth, and perfectly black. The legs are scarcely thicker than a quill, and have been used for similar purposes with those of the Moschus Pygmæus. The female is said to be hornless.

FIG. 4. *Guinea Antelope. Antilope Grimmia*, LINN. and CUV.

This species is named in memory of its first describer, Dr. Grimmius, to whom we owe an ample and accurate account both of its form and manners. By Linnæus it was arranged under the genus *Moschus*, the specimen described by Dr. Grimmius having been a female, and destitute of horns.

The Guinea Antelope, or Grimm, is considerably smaller than a Roebuck, and is of an elegant and lively aspect. Its colour on all parts, except the throat, abdomen, and insides of the thighs, where it is a pale cinereous, is a beautiful light yellowish or tawny brown: like most other quadrupeds, however, it differs as to the intensity of its colour; and the specimen described by Mr. Vosmaer, at the Hague, had a black stripe on the forehead, and a blackish or dusky cast on the upper parts of the body. The horns are very short,* thick at the base, very slightly annulated to a small distance beyond, and are sharp-pointed, smooth, and black: the limbs are slender; the tail rather short, blackish above, white below, and is somewhat flocky or loose-haired; but what principally distinguishes this species is an upright pointed tuft of strong black hairs rising from the top of the forehead, beneath the horns, to the height of about two inches and a half: the sinus lachrymalis, as in many other antelopes, is extremely conspicuous.

The Grimm is found in several parts of Africa, extending, according to Dr. Pallas and Mr. Pennant, from Guinea to the Cape of Good Hope; residing principally in places overgrown with brush-wood, into which it may retire on the approach of danger. In the Leverian Museum is a very beautiful specimen of this animal, which is elegantly figured in the Museum Leverianum.

FIG. 5. *Gnou Antelope. Antilope Gnu*, LINN. and CUV.

The Gnou, or Ox-headed Antelope, is readily distinguished by the remarkable form of its horns, which are nearly smooth, very strong, pointed, projecting forwards to some distance from the base, and then pretty suddenly reverting upwards. It is a large species, equalling, or exceeding, when full grown, the size of a stag,† and is of a dull rufous-brown colour, with very long black hairs hanging from the breast: the chin and throat are also strongly bearded, and along the top of the neck to some distance down the back runs a very strong and somewhat upright mane of ash-coloured hair: the head is very large, the mouth square, the lips covered with short stiff bristles, and from the nose up the forehead runs a kind of oblong square brush of stiff reversed bristles, while the hairs of the cheeks are disposed downwards: round the eyes grow several very strong white bristles in a radiated manner: the tail somewhat resembles that of a horse, and is full of hair, and of a white colour. The limbs of the Gnou are light and elegant, though the form of the head and body is thick and heavy: it is said to have only one false hoof behind each foot, instead of the usual pair: each foot is marked by a blackish or dusky bar above the hoof. The Gnou, says Mr. Allamand, is a very singular compound of animals; uniting the strong head and horns of the Bull, with the lightness and skin of the Stag, the beauty of the mane, body and tail of the Horse, and the sinus lachrymalis‡ of the Antelope.

The Gnou, says Mr. Pennant, is a fierce and dangerous animal, but is sought after on account of its flesh, which is an excellent kind of venison. It is principally found in the country of the *Nimiquas*, where it lives in large herds. The female is said to be horned like the male, and in the young animals the horns are quite straight.

Of this highly singular species a coloured drawing was sent by the late Lord Bute to the Count de Buffon, under the name of *Fefa Heda*, or *Bos-Buffel;* and another drawing, supposed to be more exact, was communicated by the Viscount Pisciolini, which latter is engraved. The engraving, however, afterwards published by Mr. Allamand, having been executed with great care from the living animal, is supposed to be more exact than any other, and is therefore introduced into the present publication.

PLATE CLXXII.—ORNITHOLOGY.

Order GALLINAE. Genus OTIS. Genus STRUTHIO.

FIG. 1 & 2. *Great male and female Bustard. Otis Tarda*, LINN. and CUV.

This species is the largest of the British birds, the male frequently weighing so much as twenty-five or thirty pounds, attaining the height of four feet, and his wings expanding about nine: on each side of the lower mandible of the beak is a tuft of long feathers, constructed of delicate and unconnected webs: the head, neck, breast, and edge of the wing, are gray, inclining to brown on the tip of the head: the back and lesser wing coverts are elegantly barred with black and pale ferruginous: the greater coverts are pale cinerous: the quills are black, slightly tipped with white: the under parts are white: the tail white, consisting of twenty feathers; the middle ones are rust-colour, barred with black; the two outer ones reddish at the base, and for two-thirds of their length: they have two bands of black towards their tip: legs dusky: beak bluish: irides light hazel.

The female is destitute of the tuft on each side of the mandible, and is not above half the size of the male: her crown is of a deep orange, crossed with transverse black lines; the rest of the head brown: the lower part of the neck in front ash-coloured, in other respects similar to the male, except being less brilliant in colour on the back and wings.

The male of this fine species possesses a curious bag or pouch, situated in the fore-part of the neck, and capable of containing about two§ quarts of liquid; the entrance to it is imme-

* Dr. Gmelin, in his edition of the Systema Naturæ, speaks of the horns as being eighteen inches long; probably mistaking Mr. Pennant's expression, "*height* 18 *inches*," by which he means the height of the animal itself.

† One brought over to Holland, and described by Mr. Allamand, was about three feet and a half long, from the forehead to the tail; but it grows to a far larger size, being generally equal or superior to a large Stag.

‡ The *sinus lachrymalis*, which in this tribe of animals is peculiarly conspicuous, is that small channel or duct situated at the interior angle of the eye. In the Antelopes it forms a large extended fissure or furrow on the skin. It is also very large in some of the Deer tribe.

§ Some writers say seven; but the weight of so great a quantity of fluid placed in the neck seems to be more than the bird would be able to fly with.



GENUS *OTIS* (Bustard)

1. *Tarda*. GREAT B. Male & Female 2.

GENUS *STRUTHIO* (Ostrich)

3. *Rhea*. AMERICAN O. 4. *Casuarius*. CASOWARY. 5. *Novæ Hollandiæ*. NEW HOLLAND CASOWARY.

diately under the tongue. This singular reservoir was discovered by Dr. Douglas, who supposes that the bird fills it with water to supply its thirst in the midst of those extensive plains where it is accustomed to wander: a further use of it has also been observed at Morocco, where they fly the Hawk at the Bustard; for on the attack of the Hawk it has been known that the Bustard has made use of this appendage, by squirting the water that is contained therein with violence against the assailant, who is often baffled in the pursuit.

Bustards appear to be natives of the greater part of Europe, but are not of equal frequency in all parts, particularly in well inhabited countries, as they from timidity avoid all commerce with mankind, and the most paltry dog will drive whole herds of them away. In England they used to be met with in flocks of fifty or more, frequenting the open countries of the south and east parts, from Dorsetshire as far as the wolds in Yorkshire, but now they have become extremely scarce, the plains of Wiltshire furnishing the greater portion; but they are in danger of total extirpation, as half a guinea is given in that part for the egg, and ten or twelve guineas for a pair of the birds; in consequence the former is sought after for the purpose of hatching under common poultry, and the latter are often taken by the shepherds' dogs before they can fly.

These birds pair early in the spring: the female lays two eggs, in a hole formed by her feet on the bare ground; they are about one month hatching, and are the size of those of a Goose, of an olive-brown colour, marked with spots of a deeper hue. If, during her absence from the nest, any one handles or even breathes upon the eggs, she immediately abandons them. The young ones follow the dam soon after they are excluded from the egg, but are not capable of flying for some time.

The food of these birds consists of green corn, the tops of turnips, and various other vegetables, as well as worms; but they have been known also to eat frogs, mice, and young birds of the smaller kind, which they swallow whole: in the winter they frequently feed on the bark of trees; they will also swallow any small substance presented to them, somewhat like the Ostrich. The chase of the Bustard is said to afford excellent diversion: they are slow at taking flight, but run so fast that nothing but greyhounds can overtake them. They do not appear to be capable of domestication, as many attempts have been made to rear them, but they always perish in two or three years, and do not show any inclination to breed.

The Bustard is migratory, though but little so in England, where it is most abundant in autumn, but in France it is likewise seen in the spring: on all the south plains of Russia and the deserts of Tartary it is likewise common, but does not appear to be found in any other part of Asia, or at all in Africa.

FIG. 3. *American Ostrich. Struthio Rhea*, LINN. and CUV.

This bird is a native of South America, and although extremely common in many parts of that continent, specimens have rarely been seen in England: it is rather less than the Ostrich, being about six feet in height, of which the neck is two feet eight inches: the head is small, rounded, and covered with feathers: eyes black: eyelids furnished with eyelashes: the beak short and broad: the general colour of the plumage on the back and wings is dull gray, but in some individuals wholly white, in others black: the wings stretch from tip to tip no less than eight feet; but on account of the webs being disunited, are useless in flight, hanging over and hiding the tail, which is composed of short feathers of equal lengths: legs two feet and three quarters in length, furnished with three toes, all placed forwards, and the rudiment of a fourth behind.

This bird appears to be most numerous in the vicinity of the lake Nahuelquapi, in the valley of the Andes: it is also abundant, according to Faulkner, Wallis, and others, in Patagonia. It lives on fruits, and, like the Ostrich, devours any thing offered to it: its favourite food is flies, which it catches very nimbly: when attacked, it defends itself by kicking with its feet, either behind or before: the female is said to lay from forty to sixty eggs, on the bare ground;* they contain about two pounds of liquid each. When it calls its young it gives a kind of whistle: its feathers are in great request by the Indians.

FIG. 4. *Cassowary. Struthio Casuarius*, LINN. *Casuarius Vulgaris*, CUV.

This enormous bird is thus described by Dr. Latham: "This is a large bird, and not greatly inferior to an Ostrich in bulk, though from having a much shorter neck, it is not near so tall: the length is about four feet, but from the beak to the end of the claws five feet and a half. The beak is four inches and a half long, gray brown, a little notched at the end, the gape very wide: irides the colour of a topaz: eyelids beset with hairs: the nostrils oblong, placed near the end of the beak: the ears large and open: on the top of the head is a kind of helmet, beginning at the base of the beak, and reaching to the middle of the crown; this is three inches high, and one inch broad at the base, but gradually grows thinner, so that the upper part is not more than a quarter of an inch thick; this is yellowish at the back, but blackish on the fore-part: the sides of the head are naked, being, as well as the neck, covered only with a wrinkled reddish skin, thinly beset with hairs, and tinged with a cast of both blue and purple: on the lower part on each side, forwards, are placed two fleshy membranes, one inch and a half long, and three quarters broad, part red, part blue, and take rise about the middle of the neck, where they are very slender: on the breast is a callous bare part, on which the bird rests its body when on the ground: the body in general is covered with brownish black loose-webbed feathers, two of which arise from one shaft for the most part; on the rump these feathers are fourteen inches long at least, and hang downwards in place of a tail, for the bird is destitute of one: the wing, or what is in the place of it, is not furnished with feathers, having only five bare shafts, like the quills of a porcupine, the longest ten or twelve inches, and of a dusky colour; at the end of the last joint is a kind of claw: the legs have all the three toes placed forwards, and each furnished with a claw, which is almost straight and pointed; the inner one the longest: the colour of the legs and toes grayish brown: claws black."

This species inhabits the eastern parts of Asia, towards the south, being found in the Molucca islands, those of Banda, Java, Sumatra, and parts adjoining, but nowhere in plenty, nor ever beyond the limits of the torrid zone. The deep forests of the island of Ceram, along the southern coast, abound with them. In a state of nature the female deposits three or four eggs at a time, and these are generally of a greenish or grayish colour, beautifully varied with elevated grass-green spots, and marked towards their smaller extremity with white; they are deposited in the sand, and are left to be hatched by the heat of the sun and the atmosphere, but in some countries the female sits upon them as other birds do.

The food consists of vegetables, and in confinement it will eat bread, apples, &c.; all which it swallows whole, not bruising it with the beak; and like the Ostrich, it will swallow almost any thing presented to it that is not too large to pass down the throat. Cassowaries are very fierce, and amazingly powerful, their beak being considerably stronger in proportion than that of the Ostrich, and with this they defend themselves most vigorously, and will break to pieces almost any hard substance. They strike in a very dangerous manner with their feet, either before or behind, at any object which offends them.

Many of these birds have been taken to Europe, as they bear the climate better than most animals imported from the torrid regions: several instances have occurred of their laying eggs during confinement.

* Probably this species, like the rest of the order, is polygamous, and each female deposits a dozen or more eggs in the same place.

Fig. 5. *New Holland Cassowary. Struthio Novæ Hollandiæ*, Linn. *Casuarius Novæ Hollandiæ*, Cuv.

This is a large bird, measuring more than seven feet in length: the beak is black: the plumage for the most part brown and gray mixed; paler on the under parts: the head differs greatly from that of the common Cassowary, being covered with feathers; nor has it any helmet or rising protuberance whatever, as in that species: the feathers however about the head and neck are of a hairy texture, and the fore-part of the chin and throat nearly destitute of any, so that the purple colour of the skin may be seen through them: the long species observable in the wings of the common sort are here wanting, but instead of them are real wings, though of so small a size as to be useless for flight; they are covered with feathers like the rest of the body, and when the bird is quite at rest, are scarcely discernible therefrom: the legs are dusky and stout; in colour not unlike those in the other species, but are greatly indented or serrated at the back part: the three toes placed in the same manner, all forwards: so far the external appearance of the bird: internally it is said to differ from every other species, particularly in having no gizzard, and the liver so small as not to exceed that of a Blackbird, yet the gall-bladder of one specimen examined was large and distended with bile: the crop contained at least six or seven pounds of grass, flowers, and a few berries and seeds: the intestinal canal six yards long: the heart and lungs separated by a diaphragm, and bore a tolerable proportion to the size of the bird.

Inhabits New Holland, where it is not uncommon, being frequently seen by our settlers there, but is exceedingly shy, and runs so swiftly that a greyhound can scarcely overtake it. The flesh is said to be very good, tasting not unlike young tender beef.

PLATE CLXXIII.—ORNITHOLOGY.

Order Picæ. Genus Certhia, Creeper. Genus Trochilus, Humming-Bird.

Fig. 1. *Great hook-billed Creeper. Certhia*, Linn. *Melithreptus Pacificus*, Cuv.

A large species: length about eight inches: colour deep black, with the rump, lower part of the belly, and thighs bright yellow: alulet or spurious wing yellowish white: quill-feathers edged with gray: under coverts mixed yellow and white: bill brownish black, very stout, long, and greatly curved: legs black. Native of Owhyhee and other South-Sea islands.

Fig. 2. *Hook-billed green Creeper. Certhia Obscura*, Linn. *Melithreptus Obscurus*, Cuv.

Length seven inches: bill an inch and three quarters long, and bent quite in the shape of a semicircle: the under mandible shortest by a quarter of an inch: colour of both brownish black: the nostrils covered by a membrane: between the bill and eye is a streak of brown: the plumage in general is olive-green, palest beneath, and somewhat inclined to yellow: quills and tail dusky; the last even at the end, and edged with yellow-green: legs dusky brown; the feathers just above the knee, or garter, white: the hind toe pretty long. Inhabits the Sandwich Islands in general, and is one of the birds whose plumage the natives make use of in constructing their feathered garments; which having these olive-green feathers intermixed with the beautiful scarlet and yellow ones belonging to the next species, and yellow-tufted Bee-Eater, make some of the most beautiful coverings of those islanders.

The mention of the yellow-tufted Bee-Eater in this description induces us to remark that, perhaps that bird, as well as some others, might with equal propriety rank under the present genus as in that of Merops; and the circumstance of the yellow tuft under each wing should seem to imply a strong alliance to the genus Certhia, in which that appendage is so frequently observed.

Fig. 3. *Hook-billed red Creeper. Certhia Coccina*, Linn. *Melithreptus Coccineus*, Cuv.

The hook-billed Red Creeper is a native of the Sandwich Islands, and is much valued by the natives on account of its plumage, which affords a principal article in the red feathered mantles worn by the chiefs and persons of distinction. Its size is equal to that of a Sparrow, and its general length about six inches: the whole bird is bright, but not very deep scarlet, the wings and tail excepted, which are black: the smaller wing-coverts are however scarlet, and the greater are tipped with white: the tail-feathers are slightly pointed at the extremities: the bill is moderately stout, rather long in proportion to the bird, very considerably curved, and of a pale yellow colour, as are likewise the legs.

Fig. 4. *Blue Creeper. Certhia Cerulia*, Linn. *Nectarinia Cærulea.*

Size of a Nightingale: length about five inches: colour on the crown of the head and whole upper parts pale brown: under parts white, but the cheeks tinged with yellow; the breast with pale blue, and the under surface of the tail blue: bill black: tongue divided and pencilled at the tip: legs yellowish brown. Native of New Holland: described and figured by Mons. Viellot, from a drawing communicated by Mr. Francillon.

Genus Trochilus.

The brilliant and lively race of Humming-Birds, so remarkable at once for their beautiful colours and diminutive size, are the peculiar natives of the American continent and adjoining islands, and, with few exceptions, are principally confined to the hotter regions. Their vivacity, swiftness, and singular appearance unite in rendering them the admiration of mankind; while their colours are so radiant that it is not by comparing them with the analogous hues of other birds that we are enabled to explain with propriety their peculiar splendour, but by the more exalted brilliancy of polished metals and precious stones; the ruby, the garnet, the sapphire, the emerald, the topaz, and polished gold, being considered as the most proper objects of elucidation.

It is not however to be imagined that all the species of Humming-Birds are thus decorated: some being even obscure in their colours, and, instead of the prevailing splendour of the major part of the genus, exhibiting only a faint appearance of a golden-green tinge, diffused over the brown or purplish colour of the back and wings. The genus is of great extent, and, in order that the species may with greater readiness be investigated, it has been found necessary to divide them into two sections, viz. the curve-billed, and the straight-billed. The exact limits of the two divisions are however difficult to determine.

The mode of life in the Humming-Birds appears to be uniform. They live by absorbing the sweet juices of flowers, which they extract with their tubular tongue, and though small insects are said to have been sometimes observed in their stomachs, yet this seems rather accidental than regular or natural.

A magnificent work has appeared on this genus by Messieurs Viellot and Audebert, in which a laudable attempt has been made to exhibit the splendour of the natural colours by means of powder or shell-gold impressed on the plates. It must be confessed that it has not succeeded in all instances so completely as might be wished. The work however is extremely valuable, not only as containing good figures of the major part of established species, but also of numerous varieties, and is preceded by an elaborate and ingenious disquisition relative to the structure of the feathers and many other particulars.

Div.n 1.st Land Birds_ Order PICÆ.



G. TROCHILUS
Humming Bird

1 C. Falcatus
Or Hook Billed C.

2 C. Obscura
Hook Billed Green C.

3 C. cocoina
Hook Billed Red C

4 C. cerulia
Blue C.

5 T. Pelta
Topaz HB.

6 T. furcatus
Lesser Forked Tailed HB.

7 T. Pinnatus
Crested HB.

8 T. Ornatus
Tufted Necked HB.

9 T. minimus
Least HB.

FIG. 5. *Topaz Humming-Bird. Trochilus pelta*, LINN. and CUV.

This is beyond comparison the most brilliant of the curve-billed Humming-Birds, its magnitude as well as colours giving it a decided superiority to the rest. It is at least equal to a Wren in the size of its body, but if measured from the tip of the bill to the end of the two middle or long tail-feathers, its extent is from eight to ten inches. The bill is moderately long, curved, and black: the upper part of the head and neck are also of a glossy black, sinking pretty suddenly, but not quite abruptly, into a fine deep orange-purple colour, which is diffused over the back and smaller wing-coverts: the throat, to a considerable distance down the neck, is of the most splendid topaz yellow, with the lustre of polished gold when exposed to the light, and changing, when viewed in particular directions, to deep emerald green: this large bed of topaz-colour is separated from the breast and sides of the neck by a narrow bar or line of black, beneath which the whole breast and sides are of a deep, but shining purple rose-colour, growing somewhat less intense as it passes down the abdomen: the wings are of a purplish brown; the rump of a bright grass-green, and the tail orange-purple, except the two middle feathers, which are purple-brown, and exceed the rest by about four inches: they are of a narrow shape, and are slightly pointed at the tips: the thighs are very thickly coated with white feathers, and the legs are black. A slight variation in the plumage of this bird is observable in different individuals, in some of which the middle part of the tail is grass-green, and the side feathers orange or chestnut with green tips.

The female is very far inferior in point of brilliancy to the male, being of a dark coppery-green colour, with a slightly-gilded rufous or copper-red stripe down the throat; dusky wings; white thighs, very thickly feathered; and ferruginous tail, with the two middle feathers dusky bluish-black, and not exceeding the rest in length.

The topaz-throated Humming-Bird is a native of several parts of South America, but is said to be principally found in Surinam and Guiana, where it is observed to frequent in preference the banks of the rivers and brooks, and this chiefly in the interior of the country. Monsr. Sonnini informs us that he has frequently seen these beautiful birds in considerable numbers in the above situations, commonly perched on the lower branches of such trees as grew on the banks of the stream, or such as from decay had fallen into the water. During their flight they skim the surface of the water in the manner of Swallows.

FIG. 6. *Lesser fork-tailed Humming-Bird. Trochilus furcatus*, LINN. and CUV.

This is a species of peculiarly neat appearance. It measures about four inches in total length, and has the tail deeply forked: the crown of the head and upper part of the neck are of a dusky colour, with a changeable green lustre: the chin and throat of the richest and most brilliant gold-green: the back and breast glossy violet-blue: the abdomen dusky black, with a whitish bar across the vent: the wings and tail violet-black, and the upper tail-coverts gold-green. It is a native of several parts of South America, and of some of the larger West-Indian islands. The bill in this species, as in some others, is so very slightly curved that it may with nearly equal propriety be ranked in either division of the genus, which has accordingly been done by different authors; Gmelin, in his edition of the Systema Naturæ of Linnæus, having placed it, after the example of Dr. Latham, among the curve-billed species, while Monsr. Viellot, on the contrary, ranks it in the straight-billed division.

FIG. 7. *Crested Humming-Bird. Trochilus puniceus*, LINN. and CUV.

The Crested Humming-Bird seems to have been first described by Edwards, who, in the thirty-seventh plate of his excellent work, has given a good figure both of the bird and its nest. The total length of the bird is three inches. "The bill," says Edwards, "is slender, sharp-pointed, and not so long as in most of this kind, of a black colour, and very little bowed downward: the top of the head, from the bill to the hinder part, which ends in a crest, is first green, and toward the hinder part dark blue: both these colours shine with a lustre far exceeding the brightest polished metals; the green part especially, which is the lightest in some lights, changes from green to gold-colour, so beautiful as not to be expressed by colours, or hardly conceived in the absence of the object: the feathers of the upper part of the body and wings are dark green intermixed with gold-colour; just beneath the bill is a spot of dirty white: the breast and belly are of a dark, dirty, grisled or mixed gray colour: the quills are of a purple colour, and the tail is of a bluish black, somewhat glossy on the upper side, the under side more glossy than the upper, which is not common: the legs and feet are very small, and of a black colour."

The female of this species differs in wanting the crest, and in being ash-coloured beneath. Native of South America and some of the West-Indian islands. In its general manners and character it seems to resemble the red-throated Humming-Bird, being of a bold disposition, attacking larger birds, and expelling them from its haunts. It frequents gardens, building on the twig of an orange-tree or jasmine, and sometimes on the projecting straws of the roof of a cottage; and if the nest and young be taken into the house, will follow, and rear the young in their state of confinement.

FIG. 8. *Tufted-necked Humming-Bird. Trochilus ornatus*, LINN. and CUV.

Its total length is about three inches: the bill is reddish at the base, but black at the tip, and is covered for about one fourth of its length by minute gold-green plumes: the forehead, hind-head, back, and wing-coverts are of a bright gold-green colour: the wings violet-brown: the throat, to a considerable distance down the neck, of a most brilliant golden green, forming a kind of shield, as in the topaz-throated Humming-Bird, and appearing brown when viewed in particular lights: the remainder of the under parts are rufous brown, the rump and vent-feathers ash-coloured: on the top of the head is a most elegant ascending crest, composed of soft silky plumes of a very bright cinnamon or ferruginous colour, and on each side the neck, pointing backwards, and extending to a very considerable distance, is a tuft or series of numerous, unequal, lengthened plumes, of a bright rufous colour, rather paler towards the end, and terminating in a dilated tip of a deep but lucid gold-green colour. In the young bird these plumes are shorter and broader than in the full-grown one, and of a gilded copper-green cast. The female is of similar colour to the male, but more of a rufous cast beneath, and is destitute both of the crest and side-plumes which form so conspicuous an ornament in the male. This species is a native of Guiana.

FIG. 9. *Least Humming-Bird. Trochilus minimus*, LINN. and CUV.

The smallest of all the genus; and consequently of the whole feathered tribe. General length from sixteen to seventeen lines, or rather more than an inch and a quarter: colour on the upper parts, green-gold, the quill and tail-feathers glossy violet-brown or blackish, and the exterior tail-feathers edged and tipped with white: under parts pale or whitish gray in the male, and dusky gray in the female. Native of several parts of South America, and of some of the West-Indian islands, particularly, as is said, of Jamaica. It seems to have been first correctly described by Edwards; for on the loose general descriptions of Marcgrave, and repeated by Willughby, &c. no dependence can be placed. "The bill," says Edwards, "and whole upper side of the head, neck, body, wings, and tail are of a dirty brown colour, yet in the sunshine there is a small gloss of a gold-green colour, which

strikes not the eye in common lights; the under side of the head, neck, and belly, are of a dirty white; the outside feathers of the tail are also white; the legs and feet are black; the bird, when dried, weighed no more than five grains. I take it to be the same as the *Smallest Humming-Bird* of Sir Hans Sloane's History of Jamaica, vol. 2. p. 307, where he says it weighed not over twenty grains when just killed."

The above specimen, from Edwards' description of the colours, appears to have been a female. The figure engraved in Sloane's Jamaica is represented by far too large for the bird, and is otherwise so ill executed as to be unworthy of quotation. The figure given in Brisson's Ornithology, and repeated in the Planches Enluminées of Buffon, agrees in size with that of Edwards. Those represented in the work of Monsr. Viellot are a trifle larger, or at least longer, measuring about an inch and five eighths in length, and were brought from America by Dufresne. The gold-green of the upper parts is more brilliant in these figures than the general tenor of descriptions would lead us to suppose; but in these birds, as in all others, considerable diversity as to the colour of the plumage must be expected to take place in individuals of different ages, and in different degrees of perfection. A pair of this species in the British Museum are of a brownish-green above, with but a slight appearance of a gilded lustre. They are reported however to have belonged to the collection of Sir Hans Sloane, and may therefore well be supposed to have lost much of their original lustre of plumage.

The nest of this species is described as rather large for the size of the bird, but this appearance is owing to its thickness: it is covered outwardly with lichens, and lined with fine cotton or other downy substances: the eggs are said to be of the size of coriander seeds, and of a dull white colour

PLATE CLXXIV.—CRUSTACEA.

We have already adverted to the fact, that the genus CANCER of Linnæus has of late years been subdivided into a great number of new genera, founded on differences in habits, and anatomical structure.

The annexed plate exhibits species of six of the genera established since Linnæus, viz. Scyllarus, Squilla, Pagurus, Pandalus, Caprella, and Astacus.

The genus SCYLLARUS is also called the Sea-Grasshopper: their lateral antennæ present a very unusual character; the stem is wanting, and the joints of the peduncle, very much dilated transversely, form a large, flattened, horizontal crest, more or less dentated.

FIG. 1. *Scyllarus arctus*, FAB. and CUV. *Cancer arctus*, LINN. Inhabits the seas of Northern Europe.

The genus SQUILLA have an extremely narrow groove along the whole inner side of the penultimate segment of the two large claws,—dentated on one of its edges, and spirous on the other; and the ensuing joint, on the claw, is falciform, and usually dentated.

FIG. 2. *Squilla digitalis*, LAT. and CUV. *Cancer digitalis*, LINN.

The genus PAGURUS has the four posterior feet much shorter than the others, and the forceps are covered with granules. The tail is soft, long, cylindrical, and narrowed near the extremity. With the exception of a few species, the Paguri inhabit univalve shells, whose aperture they close with their claws.

FIG. 3. *Pagurus strigatus*, FAB. and CUV. *Cancer strigatus*, LINN.

FIG. 5. *Pagurus dubius*, CUV. *Cancer dubius*, LINN.

The genus PANDALUS is characterized by having its two anterior feet simple; the next two are longer, of unequal length, and dydactyle. The anterior projection of the shell is greatly extended, and many-toothed.

FIG. 4. *Pandalus norwal*, LEACH and CUV. Inhabits the Mediterranean sea.

The genus CAPRELLA has ten feet, but in an interrupted series, commencing with the second segment, exclusive of the head: both this segment and the following one have two vesicular bodies, and are without feet.

FIG. 6. *Caprella linearis*, LAM. and CUV. *Cancer linearis*, LINN.

The genus ASTACUS has pedunculated antennæ, which are unequal, the exterior ones being long and setaceous, the inner pair divided at the extremity: body elongated; mostly ten legs; tail foliaceons. It includes the whole tribe of Lobsters, Crawfish, and Shrimps.

FIG. 7. *Astacus fluviatilis*, CUV. *Cancer fluviatilis*, LINN. Inhabits the Nile, and the rivers of Southern Europe.

PLATE CLXXV.—ICHTHYOLOGY.

CEPOLA is the name given by naturalists to a genus of *thoracic* fishes, which have a roundish head, somewhat compressed; teeth curved, and placed in a single row; gill-membrane six-rayed; body ensiform, naked; belly rather shorter than the head.

FIG. 1. *Cepola rubescens*, CUV. *Cepola tænia* of some authors. This fish is a native of the Mediterranean, and attains a length of three or four feet. It frequents shallow water, destroying crustaceous animals. Its flesh is disagreeable, and seldom eaten.

The genus ECHENEIS is characterized by a naked head, flat above, and transversely furrowed; the gill-membrane is furnished with ten rays, and the body is destitute of scales.

FIG. 2. *Echeneis remora*, LINN. and CUV. This fish inhabits the Mediterranean and Atlantic seas, but is most common in the latter. Its extraordinary faculty of adhering at pleasure to other bodies, by means of the structure on the back of its head, is mentioned by many writers. Pliny, and some others among the ancients, do not hesitate to say that the remora is able to arrest the motion of a ship in full sail by fastening on its hull. The moderns are more moderate, and simply relate that it is capable of attaching itself so firmly to any smooth surface as to be with difficulty removed; even requiring a strong hand and a lateral motion, so as to slide it from the substance to which it adheres. This faculty is designed to afford the remora a provision for sustenance; for, being a sluggish swimmer, it makes amends for the disadvantage by fixing itself on the backs of whales, sharks, and other large sea animals.

The fishes of the genus GOBIUS (Sea-Gudgeons) are at once recognized by the union of their thoracic ventral fins, either along the whole of their length, or at least at their base. The spines of the dorsal fin are flexible, and the branchial apertures are provided with five rays only.

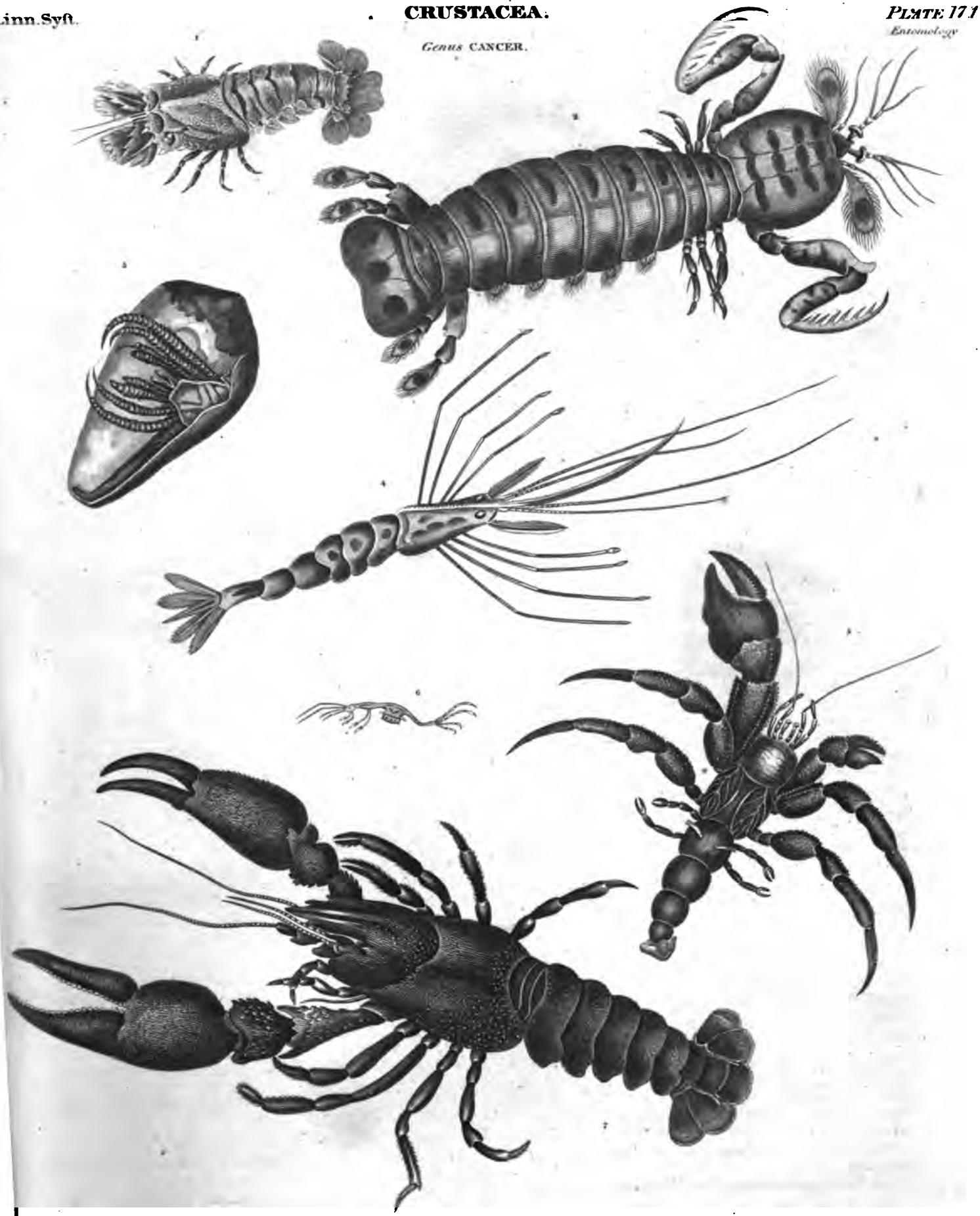
FIG. 3. *Gobius minutus*, CUV. Minute, or spotted Goby, of Pennant.

This little fish rarely exceeds two inches and a half in length. It is common in the seas of Europe.

The genus CORYPHÆNA is marked by a sudden, downward slope of the head; the gill-membrane is furnished with five rays, and the dorsal fin extends the whole length of the back.

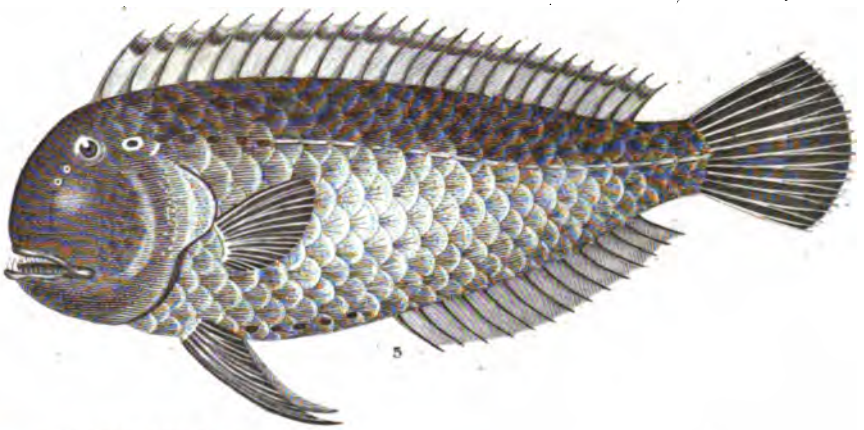
FIG. 4. *Coryphæna hippuris*. Dolphin, of the sailors. Most of the fishes of this family are distinguished by their brilliancy,

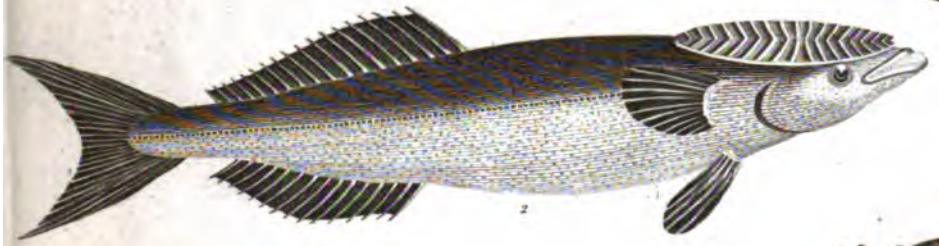
Genus CANCER.

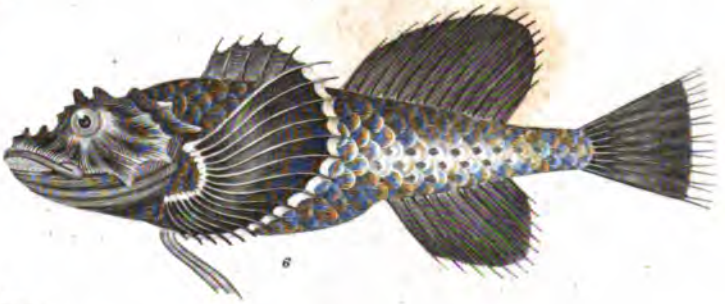




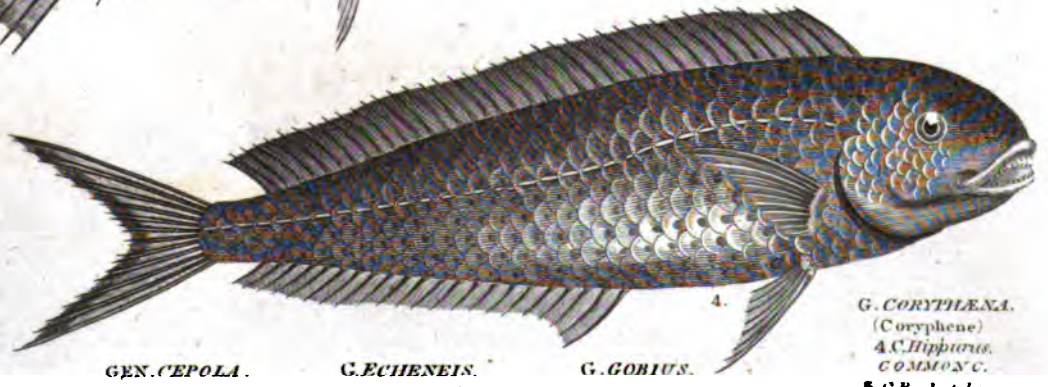












G. COTTUS.
(Bull Head)
6. C. Gruniens.
GRUNTING BULL HEAD.
7. C. Cataphractus.
MAILED B.H.

GEN. CEPOLA.
(Ribband Fish)
1 C. Tænia.

G. ECHENEIS.
(Sucking Fish)
2. E. Remora.
MEDITERRANEAN S.F.

G. GOBIUS.
(Goby)
3. G. Minutus.
SPOTTED G.

G. CORYPHÆNA.
(Coryphene)
4. C. Hippuris.
COMMON C.
5 C. Pentadactyla.
FIVE SPOT C.

ENTOMOLOGY.

Order Coleoptera.

GENUS *OPATRUM* – G. *TRITOMA* – G. *TETRATOMA* – G. *CASSIDA*.



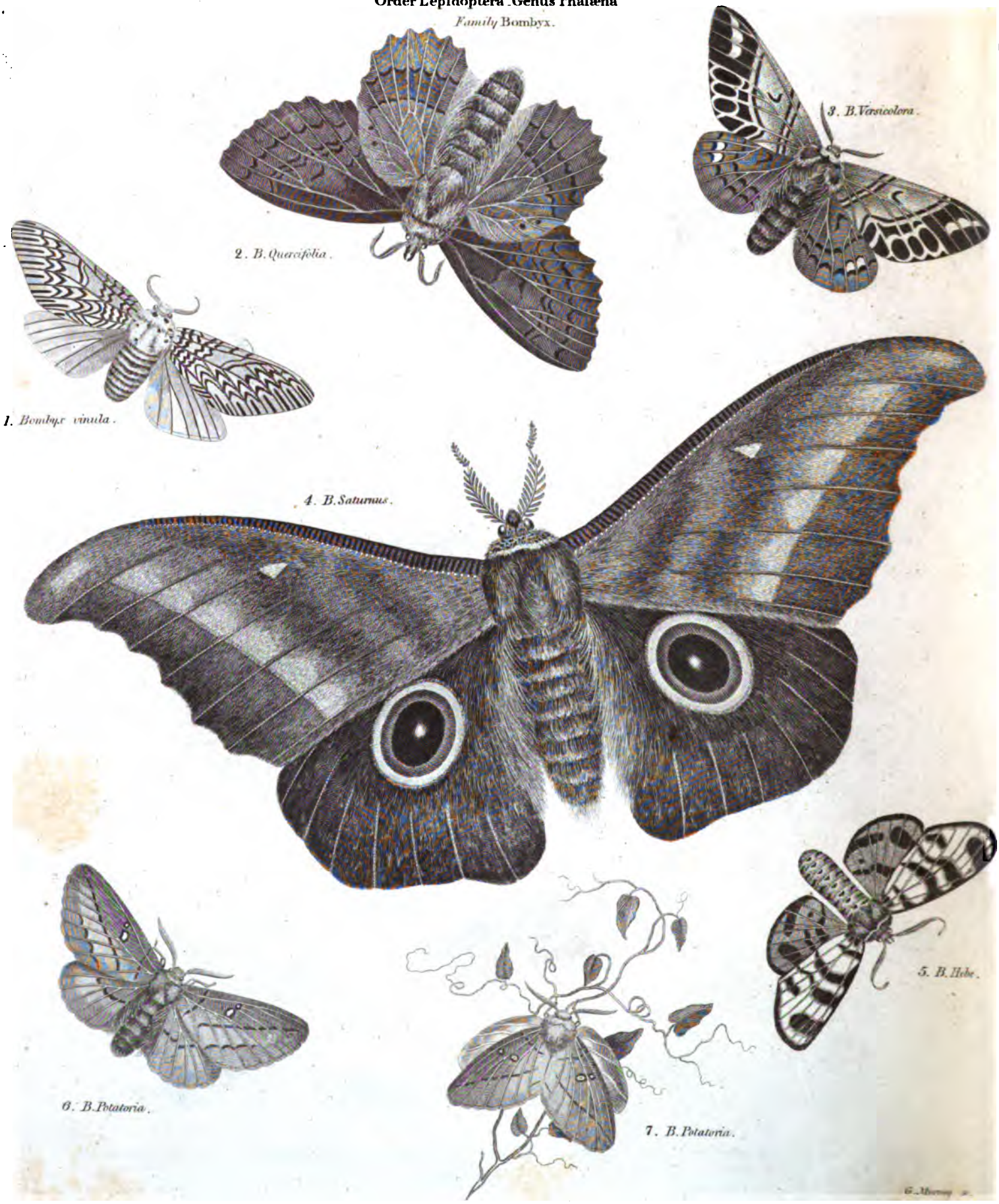
1.O.sabulosum – 2.Tri.rufipes – 3.Tri.pilosa – 4.Tet.cinnamoneum – 5.Tet.fungorum – 6.Tet.ancora – 7.C.grassa – 8.C.lateralis – 9.C.cruentata – 10.C.maculata –

a magnified b under surface

G.S.

Order Lepidoptera .Genus Phalæna

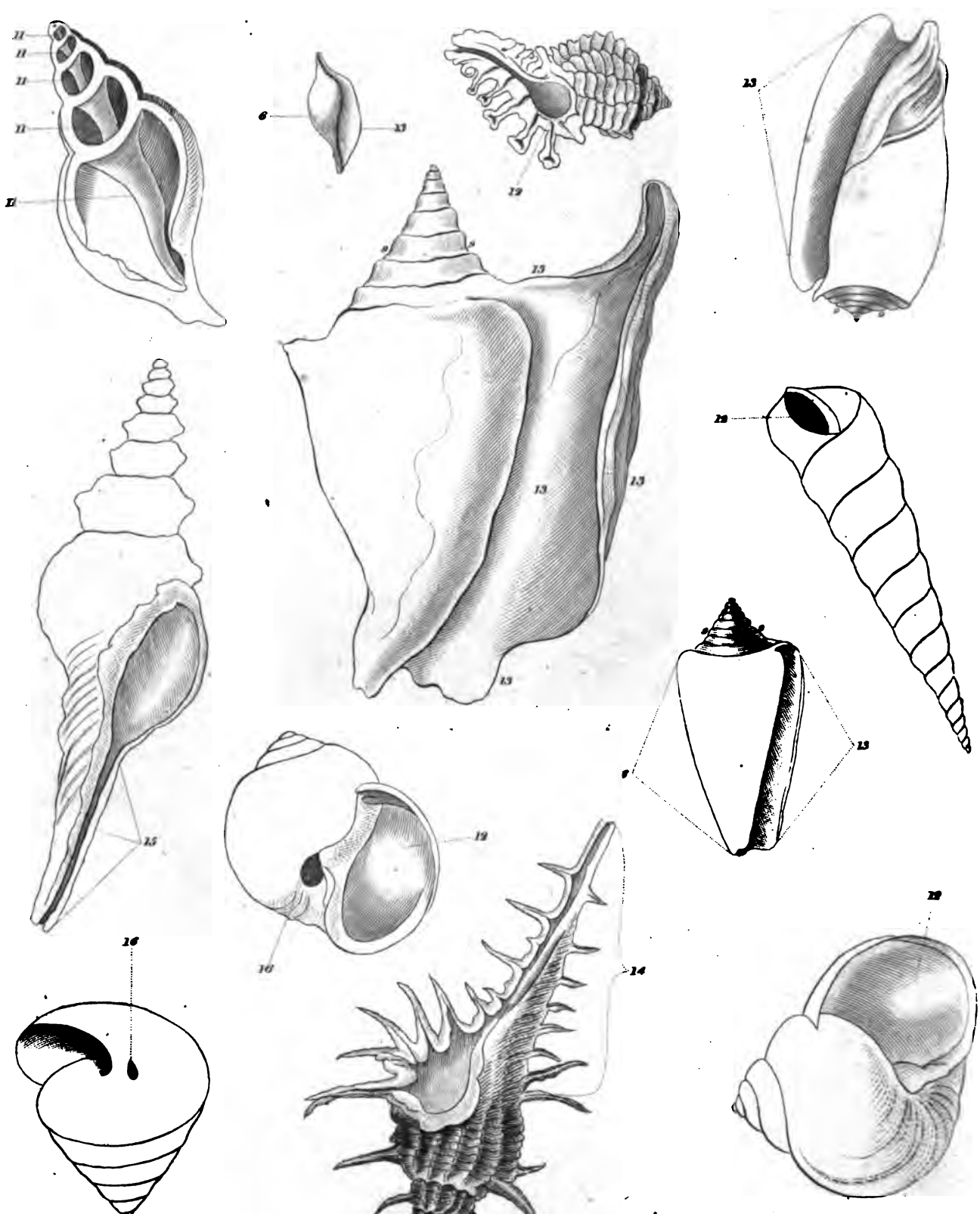
Family Bombyx.



CONCHOLOGY.

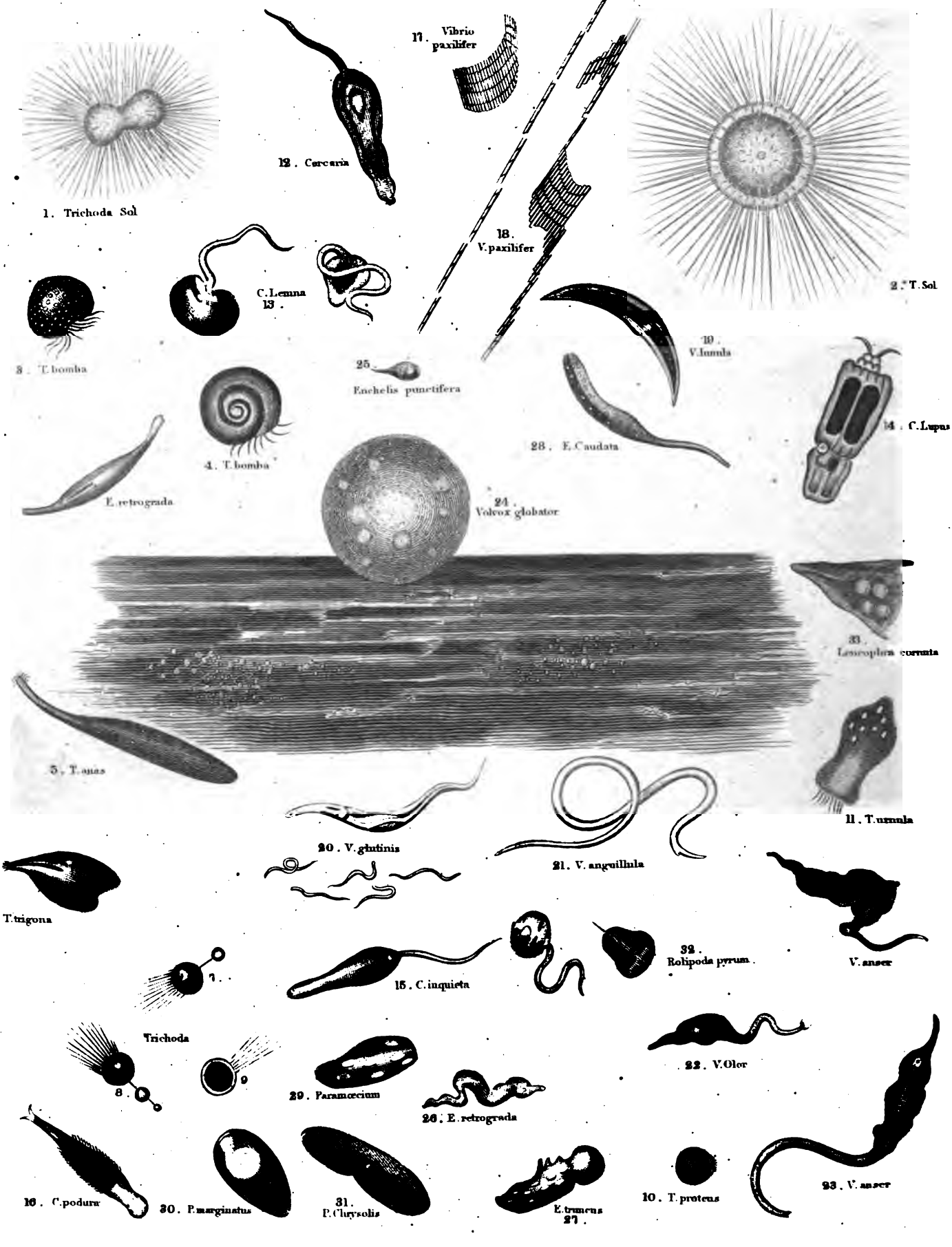
Elementary.

UNIVALVE.



11. Pillar or Columella. 12. Aperture. 13. Lip. 14. Beak. 15. Canal. 16. Umbilicus.

Kinnear Sc.


1. Trichoda Sol
2. T. Sol
3. T. bomba
4. T. bomba
5. T. anas
6. T. trigona
7.
8.
9
10. T. proteus
11. T. urnula
12. Cercaria
13. C. Lemna
14. C. Lupus
15. C. inquieta
16. C. podura
17. Vibrio paxillifer
18. V. paxillifer
19. V. lunula
20. V. glutinis
21. V. anguillula
22. V. Olor
23. V. anser
24. Volvox globator
25. Enchelis punctifera
26. E. retrograda
27. E. truncus
28. E. Caudata
29. Paramœcium
30. P. marginatus
31. P. Chrysalis
32. Rotipoda pyrum.
33. Leucophra cornuta
E. retrograda
V. anser
Trichoda

but the present species has in this respect no rival. It grows from three to five feet long; its colour is a beautiful blue-green, glossed with gold on the back, and becoming silvery towards the abdomen; whence its Portuguese name of *Dorado*. But on its removal from the water its colours begin to fade, and as it dies it assumes a general ashy tint. It is rapid in its motions, and voracious for food. It will follow ships a great distance, devouring with avidity whatever falls overboard.

Fig. 5. *Coryphæna pentadactyla*, Linn. *Xirichthys pentadactylus*, Cuv. Five-spotted Coryphene.

This species is characterized by five black longitudinal spots near the head. It inhabits the seas of the Molucca islands in such vast numbers, that it affords a branch of commerce to those people almost as important as that of the cod-fishery among the Europeans. Its flesh is white and well-flavoured.

The genus Cottus is very remarkable. Its head is broader than its body, and spinous: its eyes are vertical, and furnished with a nictitant membrane; the gill-membrane has six rays: the body is round, and without scales.

Fig. 6. *Cottus grunniens*, Linn. Bull-Head.

This fish does not exceed eight inches in length. It is called the grunting bull-head, because when taken it makes a noise not unlike the grunting of a pig. Inhabits both the East and West Indies.

Fig. 7. *Cottus cataphractus*, Linn. *Agonus cataphractus*, Cuv. Armed Bull-Head.

This fish obtains its name both from its general armed appearance, and the two curved horns on its head. It inhabits the seas of Europe.

PLATE LXXVI.—ENTOMOLOGY.

The genus Opatrum of Linnæus has moniliform antennæ, thicker towards the tip; the head is projected from a cavity in the thorax, which last is a little flattened and marginated: shells emarginated and longer than the abdomen.

Fig. 1. *Opatrum subulosum*, Linn.

In the genus Tritoma the antennæ are club-shaped, the club being perfoliate, and the anterior feelers hatchet-formed. But few species are known.

Fig. 2. *Tritoma rufipes*, Linn.

Fig. 3. *Tritoma pilosa*, Linn.

In the genus Tetratoma the body is ovoid, the tibiæ are narrow and without spines, and the antennæ are as long as the head and thorax, and terminated by an oval club of four joints.

Fig. 4. *Tetratoma cinnamoneum*, Linn.

Fig. 5. *Tetratoma fungorum*, Linn.

Fig. 6. *Tetratoma ancora*, Linn.

The genus Cassida is characterized as follows: antennæ moniliform, thicker towards the end; thorax and wing-cases with a broad margin, the former flat and forming a kind of shield, beneath which the head is concealed.

Fig. 7. *Cassida grassa*, Linn.

Fig. 8. *Cassida lateralis*, Linn.

Fig. 9. *Cassida cruentata*, Linn.

Fig. 10. *Cassida maculata*, Linn.

PLATE LXXVII.—ENTOMOLOGY.

In a former part of this work, some remarks were made on the character and habits of the Linnæan genus Bombyx; and on the present occasion, six additional species are illustrated, viz.

Fig. 1. *Bombyx vinula*, Linn. *Chelonia vinula*, Lat.

Fig. 2. *Bombyx quercifolia*, Linn. *Lasiocampa quercifolia*, Lat.

Fig. 3. *Bombyx versicolora*, Linn. *Sericaria versicolora*, Lat.

Fig. 4. *Bombyx saturnus*, Linn. *Saturnia*, Lat.

Fig. 5. *Bombyx hebe*, Linn. *Callimorpha hebe*, Lat.

Fig. 6 & 7. *Bombyx potatoria*, Linn. *Lasiocampa potatoria*, Lat.

PLATE LXXVIII.—CONCHOLOGY.

The annexed plate is designed to illustrate the terms in use among conchologists, for the several parts of univalve shells, the same number referring to the same parts in different shells.

Fig. 6. Represents the body of a shell, called also its larger whorl, or volution.

Fig. 11. Is the pillar or columella: in the upper left-hand figure, the columella is seen traversing all the chambers of a shell, like an irregular axis.

Fig. 12. Aperture, or mouth.

Fig. 13. Outer lip, right lip, or labrum.

Fig. 14. Beak, or rostrum.

Fig. 15. Channel, or canal.

Fig. 16. Umbilicus.

PLATE LXXIX.—INFUSORIA.

Naturalists, says Cuvier, usually close the catalogue of the animal kingdom with beings so extremely minute as to be invisible to the naked eye, and which have only been discovered since the invention of the microscope has unveiled to us, as it were, a new world.

Most of these present a gelatinous body of extreme simplicity, while others are more complex, but of a structure almost beyond the reach of anatomical investigation.

The first of these animals we shall examine is the genus Trichoda, of which the body presents neither viscera nor other complication, and is frequently destitute of the appearance of a mouth: the whole is surrounded by *cilia* or divergent rays of a most delicate texture.

Fig. 1 & 2. *Trichoda sol*, Cuv.

Fig. 3 & 4. *Trichoda bomba*, Cuv.

Fig. 5. *Trichoda anas*, Cuv.

Fig. 6. *Trichoda trigona*, Cuv.

Fig. 7, 8, & 9. Represent a globular species in which the cilia are confined in a segment of the sphere.

Fig. 10. *Trichoda proteus*, Cuv.

Fig. 11. *Trichoda urnula*, Cuv.

The genus Cercaria, (which, with the preceding, belongs to Cuvier's class Homogenea,) has an oval body terminated by a thread. To this genus belong those animalcules sometimes observed in the seminal fluid of various animals, and on which such fantastic theories have been founded.

Fig. 12. Represents a transverse section of a Cercaria.

Fig. 13. *Cercaria lemna*, Cuv.

Fig. 14. *Cercaria lupus*, Cuv.

Fig. 15. *Cercaria inquieta*, Cuv. (Two views.)

Fig. 16. *Cercaria podura*, Cuv.

In the genus Vibrio, the body is round and slender, like a piece of thread.

Fig. 17 & 18. *Vibrio paxilifer*, Cuv. Two views of a magnified specimen.

Fig. 19. *Vibrio lunula*, Cuv.

Fig. 20. *Vibrio glutinus*, Cuv. These are the pretended eels seen in vinegar and paste; the former are frequently perceptible to the naked eye. It is asserted that they change their skin, consist of two sexes, produce living young ones in summer, and eggs in autumn. Freezing will not kill them.

Fig. 21. *Vibrio anguillula*, Cuv.

Fig. 22. *Vibrio olor*, Cuv.

Fig. 23. *Vibrio anser*, Cuv.

The genus Volvox has a globular body revolving on its axis, and frequently containing smaller globules, which are doubtless the continuation of the race.

Fig. 24. *Volvox globator*, Cuv.

In the genus Enchelis the body is oblong, softer and less determined than that of a *Vibrio*.

Fig. 25. *Enchelis punctifera*, Cuv.

Fig. 26. *Enchelis retrograda*, Cuv.

Fig. 27. *Enchelis truncus*, Cuv.

Fig. 28. *Enchelis caudata*, Cuv.

The genus Paramecium has a flat, oblong body.

Fig. 29. Represents a transverse section of a Paramecium.

Fig. 30. *Paramecium marginatum*, Cuv.

Fig. 31. *Paramecium chrysolis*, Cuv.

In the genus Kolpoda, the body is flat and sinuous.

Fig. 32. *Kolpoda pyrum*, Cuv.

In the genus Leucophra the cilia are stout, and somewhat resemble horns.

Fig. 33. *Leucophra cornuta*, Cuv.

PLATE CLXXX.—QUADRUPEDS.

Class Mammalia. Order Primates. Genus Simia. Division Ape.

Genus Pithecus.—Cuvier.

Generic character. Incisory teeth $\frac{4}{4}$, canines $\frac{1}{1}$, molars $\frac{5}{5}$, total 32. The canine teeth are somewhat larger than the others; the molars more equal than in man, with the tubercles more produced; the head orbicular, without a superciliary ridge. While young, facial angle 50 deg. to 60 deg.; no cheek pouches; ears rounded, as in the human species; arms much longer than in man; thumbs rather short; tailless; some of the species with callosities on the hinder parts.

Fig. 1 & 2. *Orang-Outang. Simia Satyrus*, Linn. *Pithecus Satyrus*, Cuv. and Geoffroy.

The orang-outang is an inhabitant of Cochin-China, Borneo, Malacca, Sumatra, and several of the larger islands of the Indian Archipelago. He is next in order to the chimpansé in his resemblance, in external conformation, to the human species, and is endowed with considerable intelligence. He lives in remote situations, avoiding man, and is, consequently, rarely seen in a full-grown state. He is of gigantic stature, measuring from seven and a half to eight feet.

Much confusion has existed regarding this species, as it has been confounded in its immature state with the chimpansé, and other larger apes. We have had many vague accounts and fables concerning it. All that have hitherto reached Europe, have been young ones; and probably the change of climate has checked their growth; for these animals are found only under a tropical sun, and their geographical range is excessively limited. It was not till the description of the animal, by Dr. Clarke Abel, in May, 1825, that we had any satisfactory account of the great wild man of the woods. As this species appears to approach very near to the human form, and far exceeds man in size, we trust we shall be excused for giving more lengthened details concerning him, than other animals. We quote Dr. Abel's interesting account of the orang-outang:

"My attention was first directed to this orang-outang, by the following notice of the animal in the Hurkara newspaper, which was sent to it, as I have ascertained, from one of the persons actually concerned in his capture:—'A party having landed on the north coast of Sumatra, from the Mary Anne Sophia, Captain Cornfoot, for the purpose of watering, fell in with an animal of the monkey species, of a most gigantic size. It was upwards of seven feet in height; and, after receiving seven shots, was killed. After the fifth shot, it climbed a tree, and reclined against its boughs, to all appearance, in great pain, and vomited a considerable quantity of blood. Some of the teeth are about three inches long. The lower jaw is immense; and the skin of its arms, although cut off from the wrist, was considerably longer than the length of a man's arm about six feet high. The back is remarkably broad, and is covered with long, coarse, brown hair. Its gait was slovenly; and as it went, it waddled from side to side.'—In addition to the foregoing information, I may mention, that I have conversed with Captain Cornfoot, commander of the Mary Anne Sophia, and received from him a verbal description of the animal, which, in most respects, corresponds with others that have been published. His statement regarding the height of the animal is, that it was a full head taller than any man on board, measuring seven feet in what would be its ordinary standing posture, and eight feet when it was suspended, for the purpose of being skinned. Captain Cornfoot dwells much upon the human-like expression of its countenance, and especially on the beautiful arrangement of its beard. He also obliged me with some account of its capture, as reported to him by his officers, and feelingly described the piteous action of the animal on being wounded, and its apparent tenacity of life. It seems, that on the spot where this animal was killed, were five or six trees, which occasioned his hunters great trouble in procuring their prey; for, in consequence of the extreme agility and power of the animal, in springing from branch to branch, and bounding from one tree to another, his pursuers could not fix their aim, until they had cut down all the trees but one. When thus limited in his range, the orang-outang was shot, but did not die till he had received five balls, and the thrust of a spear. One of the five balls probably penetrated his lungs, as he, immediately after the infliction of the wound, slung himself by his feet from a branch, with his head downwards, and allowed the blood to flow from his mouth. On receiving a wound, he always put his hand over the injured part, and distressed his pursuers by the human-like agony of his expression. When on the ground, after being exhausted by his many wounds, he lay as if dead, with his head resting on his folded arms. It was at this moment, that an officer attempted to give the *coup de grâce*, by pushing a spear through his body; but he immediately jumped on his feet, wrested the weapon from his antagonist, and shivered it in pieces. This was his last wound, and last great exertion; yet he lived some time afterwards, and drank, it is stated, great quantities of water. Captain Cornfoot also observed, that the animal had probably travelled some distance to the place where he was killed, as his legs were covered with mud up to the knees.

"The face of the animal, with the exception of the beard, is nearly bare, a few straggling short downy hairs being alone scattered over it. It is of a dark lead colour, excepting the margins of the lips, which are lighter. The eyes are small, in relation to those of man, and are about an inch apart. The eyelids are well fringed with lashes. The ears are an inch and a half in length, and barely an inch in breadth, are close to the

QUADRUPEDS.

Linn. Syst. — CLASS 1st MAMMALIA — ORDER 1st PRIMATES. — PLATE 180.

Genus IIst SIMIA — Division 1st APE.



1 ORAN OTANG.
2 CHESNUT OTANG.
3 CHIMPANZEE.
4 LONG-ARMED APE.
5 BARBARY APE.
6 PIGMY APE.
7 RED-TAILED APE.
8 STRIATED APE.

head, and resemble those of man, with the exception of wanting the lower lobe. The nose is scarcely raised above the level of the face, and is chiefly distinguished by two nostrils, three-fourths of an inch in breadth, placed obliquely side by side. The muzzle projects in a mammillary form. The opening of the mouth is very large. When closed, the lips appear narrow, but are, in reality, half an inch in thickness. The hair of the head is of a reddish brown, grows from behind forwards, and is five inches in length. The beard is handsome, and appears to have been curly in the animal's lifetime. Its colour is lighter than that of the head, approaching to a light chestnut. The hair is about three inches long, springing very gracefully from the upper lip, near the angles of the mouth, in the form of mustachios, whence descending, it mixes with that of the chin, the whole having at present a very hairy aspect. The face of the animal is much wrinkled.

"The palms of the hands are very long, are quite naked from the wrists, and are of the colour of the face. The backs of the hands, to the last joint of the fingers, are covered with hair, which inclines backwards towards the wrists, and th n turns directly upwards. All the fingers have nails, which are strong, convex, and of a black colour. The thumb reaches to the first joint of the forefinger.

"The soles of the feet are bare, and of the same colour as the hands; they are covered on the back with long brown hair, to the last joint of the toes. The great toe is set on nearly at right angles to the foot, and is relatively very short. The original colour, however, of the hands and arms, and the soles of the feet, is somewhat uncertain, in consequence of the effect of the spirit.

"The skin itself is of a leaden colour. The hair is of a brownish red; but, when observed at some distance, has a dull, and, in some places, an almost black appearance; but, in a strong light, it is of a light red. It is in all parts very long; on the fore-arm, its general direction is downwards; but, from its length, it hangs shaggy below the arm. From the shoulders, it hangs in large and long massy tufts, which, in continuation with the long hair on the back, seems to form a continuous mass to the very centre of the body. About the flanks, the hair is equally long; and in the living animal, must have descended below the thighs and nates. On the limits, however, of the lateral termination of the skin which must have covered the chest and belly, it is scanty, and gives the impression that these parts must have been comparatively bare. Round the upper part of the back, it is also much thinner than elsewhere, and small tufts at the junction of the skin with the neck, are curled abruptly upwards, corresponding with the direction of the hair at the back of the head. It measures, from one extremity of the arm to another, five feet eight inches; to this is to be added, fifteen inches on each side, for the hands and wrists, which will render the whole span of the animal equal to eight feet two inches."

The orang which was in Holland in 1776 most commonly walked on all fours, like other apes; but she could also walk erect. When, however, she assumed this posture, her feet were not usually extended like those of a man, but the toes were curved beneath, in such a manner that she rested chiefly on the exterior sides of the feet.

One morning she escaped from her chain, and was seen to ascend with wonderful agility the beams and oblique rafters of the building. With some trouble she was retaken, and very extraordinary muscular powers were on this occasion remarked in the animal. The efforts of four men were found necessary in order to secure her. Two of them seized her by the legs, and a third by the head, whilst the other fastened the collar round her body. During the time she was at liberty, among other pranks, she had taken a bottle of Malaga wine, which she drank to the last drop, and then set the bottle again in its place.

She ate readily of any kind of food which was presented to her; but her chief sustenance was bread, roots, and fruit. She was particularly fond of carrots, strawberries, aromatic plants, and roots of parsley. She also ate meat, boiled and roasted, as well as fish, and was fond of eggs, the shell of which she broke with her teeth, and then emptied by sucking out the contents. If strawberries were presented to her on a plate, she would pick them up, one by one, with a fork, and put them into her mouth, holding, at the same time, the plate in the other hand. Her usual drink was water; but she also would drink very eagerly all sorts of wine, and of Malaga in particular she was very fond. Whilst she was on shipboard, she ran freely about the vessel, played with the sailors, and would go like them into the kitchen for her mess. When, at the approach of night, she was about to lie down, she would prepare the bed on which she slept by shaking well the hay, and putting it in proper order; and, lastly, would cover herself up snugly in the quilt.* One day, on noticing the padlock of her chain opened with a key, and shut again, she seized a little bit of stick, and putting it into the keyhole, turned it about in all directions, endeavouring to open it.

When this animal first arrived in Holland, she was only two feet and a half high, and was almost entirely free from hair on any part of her body, except her back and arms; but, on the approach of winter, she became thickly covered all over, and the hair on her back was at least six inches long, of a chestnut colour, except the face and paws, which were somewhat of a reddish bronze colour. This interesting brute died, after having been seven months in Holland.

Buffon, who saw and described this individual, says he has seen it give its hand to show the company to the door: it would sit at table, unfold its napkin, wipe its lips, make use of the spoon and fork to convey the victuals to its mouth, pour out its drink into a glass, touch glasses when invited, take a cup and saucer and lay them on the table, put in sugar, pour out its tea, leave it to cool before drinking; and all this without any other instigation than the signs or commands of its master, and often of its own accord.

M. Le Compte saw an orang-outang in the Straits of Malacca, all the actions of which were so expressive and lively, that a dumb person could scarcely have rendered himself better understood. He was kind and gentle, exhibiting great affection for all those from whom he received any attentions. One thing was very remarkable, that, like a child, he would frequently make a stamping noise with his feet, for joy or anger.

His agility was astonishing. He would run about with the greatest ease and security among the rigging of the ship, vaulting from rope to rope, and playing a thousand amusing pranks, as if he had pleasure in exhibiting his feats before the company. Sometimes, suspended by one arm, he would poise himself, and then suddenly turn round upon a rope, with nearly as much quickness as a wheel. He would sometimes slide down a rope, and again ascend, with astonishing rapidity. There was no posture which this animal was incapable of imitating, nor any motion that he could not perform. He has been frequently known to fling himself from one rope to another, at a distance of more than thirty feet; evincing, in all his feats great muscular strength.

Account of an Orang-Outang.†—The orang-outang, on his arrival in Java, from Batavia, was allowed to be entirely at liberty, till within a day or two of being put on board the ship, to be conveyed to England; and, whilst at large, made no attempt to escape, but became violent when put into a large railed bamboo cage, for the purpose of being conveyed from the island. As soon as he felt himself in confinement, he took

* The same thing is mentioned by M. Le Guat. When he was at Java, he saw one make her bed very neatly every day, lie upon her side, and cover herself with the clothes. She often bound up her head with a handkerchief, and lay in bed in that state.

† From Clarke Abel's Personal Observations, made during the progress of the British Embassy through China, and on its voyage to and from that country, in 1816-17.

the rails of the cage into his hands, and shaking them violently, endeavoured to break them in pieces; but, finding that they did not yield generally, he tried them separately, and, having discovered one weaker than the rest, worked at it constantly, till he had broken it, and made his escape. On board ship, an attempt being made to secure him by a chain tied to a strong staple, he instantly unfastened it, and ran off, with the chain dragging behind; but, finding himself embarrassed by its length, he coiled it once or twice, and threw it over his shoulder. This feat he often repeated, and, when he found that it would not remain on his shoulder, he took it into his mouth.

After several abortive attempts to secure him more effectually, he was allowed to wander freely about the ship, and soon became familiar with the sailors, and surpassed them in agility. They often chased him about the rigging, and gave him frequent opportunities of displaying his adroitness in managing an escape. On first starting, he would endeavour to outstrip his pursuers by mere speed, but, when much pressed, eluded them by seizing a loose rope, and swinging out of their reach. At other times he would patiently wait in the shrouds, or at the mast-head, till his pursuers almost touched him, and then suddenly lower himself to the deck by any rope that was near him, or bound along the mainstay from one mast to the other, swinging by his hands, and moving them one over the other. The men would often shake the ropes by which he clung, with so much violence, as to make me fear his falling; but I soon found, that the power of his muscles could not be easily overcome. When in a playful humour, he would often swing within arm's length of his pursuer, and having struck him with his hand, throw himself from him.

Whilst in Java, he lodged in a large tamarind tree near my dwelling; and formed a bed by intertwining the small branches and covering them with leaves. During the day he would lie with his head projecting beyond his nest, watching whoever might pass under, and, when he saw any one with fruit, would descend to obtain a share of it. He always retired for the night at sunset,—or sooner, if he had been well fed,—and rose with the sun, and visited those from whom he habitually received food.

On board ship, he commonly slept at the mast-head, after wrapping himself in a sail. In making his bed, he used the greatest pains to remove every thing out of his way that might render the surface on which he intended to lie uneven; and, having satisfied himself with this part of his arrangement, spread out the sail, and, lying down upon it on his back, drew it over his body. Sometimes I preoccupied his bed, and teased him, by refusing to give it up. On these occasions he would endeavour to pull the sail from under me, or to force me from it, and would not rest until I had resigned it. If it was large enough for both, he would quietly lie by my side. If all the sails happened to be set, he would hunt about for some other covering, and either steal one of the sailor's jackets or shirts that happened to be drying, or empty a hammock of its blankets. Off the Cape of Good Hope, he suffered much from a low temperature, especially early in the morning, when he would descend from the mast shuddering with cold, and running up to any one of his friends, climb into their arms, and clasping them closely, derive warmth from their persons, screaming violently at any attempt to remove him.

His food in Java was chiefly fruit, especially mangostans, of which he was excessively fond. He also sucked eggs with voracity, and often employed himself in seeking them. On board ship, his diet was of no definite kind. He ate readily of all kinds of food, and especially raw meat; was very fond of bread, but always preferred fruits when he could obtain them.

His beverage in Java was water; on board ship it was as diversified as his food. He preferred coffee and tea; but would readily take wine, and exemplified his attachment to spirits by stealing the captain's brandy bottle. Since his arrival in London, he has preferred beer and milk to any thing else, but drinks wine and other liquors.

In his attempts to obtain food, he afforded us many opportunities of judging of his sagacity and disposition. He was always very impatient to seize it when held out to him, and became passionate when it was not soon given up, and would chase a person all over the ship to obtain it. I seldom came on deck without sweetmeats or fruit in my pocket, and could never escape his vigilant eye. Sometimes I endeavoured to evade him by ascending to the mast-head, but was always overtaken or intercepted in my progress. When he came up with me on the shrouds, he would secure himself by one foot to the rattling, and confine my legs with the other and one of his hands, whilst he rifled my pockets. If he found it impossible to overtake me, he would climb to a considerable height on the loose rigging, and then drop suddenly upon me. Or if, perceiving his intention, I attempted to descend, he would slide down a rope and meet me at the bottom of the shrouds. Sometimes I fastened an orange to the end of a rope, and lowered it to the deck from the mast-head, and, as soon as he attempted to seize it, drew it rapidly up. After being several times foiled in endeavouring to obtain it by direct means, he altered his plan. Appearing to care little about it, he would remove to some distance, and ascend the rigging very leisurely for some time, and then, by a sudden spring, catch the rope which held it. If defeated again by my suddenly jerking the rope, he would at first seem quite in despair, relinquish his effort, and rush about the rigging, screaming violently. But he would always return, and, again seizing the rope, disregard the jerk, and allow it to run through his hand till within reach of the orange; but, if again foiled, would come to my side, and, taking me by the arm, confine it whilst he hauled the orange up.

This animal neither practises the grimace and antics of other monkeys, nor possesses their perpetual proneness to mischief. Gravity, approaching to melancholy and mildness, were sometimes strongly expressed in his countenance, and seem to be the characteristics of his disposition. When he first came amongst strangers, he would sit for hours with his hand upon his head, looking pensively at all around him; or, when much incommoded by their examination, would hide himself beneath any covering that was at hand. His mildness was evinced by his forbearance under injuries, which were grievous before he was excited to revenge; but he always avoided those who often teased him. He soon became strongly attached to those who kindly used him. He was fond of sitting by their side, and, getting as close as possible to their persons, would take their hands between his lips, and fly to them for protection. From the boatswain, who shared his meals with him, and was his chief favourite, although he sometimes purloined the grog and biscuit of his benefactor, he learned to eat with a spoon, and might be often seen sitting at his cabin door enjoying his coffee, quite unembarrassed by those who observed him, and with a grotesque and sober air, that seemed a burlesque on human nature.

Next to the boatswain, I was perhaps his most intimate acquaintance. He would also follow me to the mast-head, whither I often went for the sake of reading, apart from the noise of the ship; and, having satisfied himself that my pockets contained no eatables, would lie down by my side, and, pulling a topsail entirely over him, peep from it occasionally, to watch my movements.

His favourite amusement in Java was swinging from the branches of trees, in passing from one tree to another, and in climbing over the roofs of houses; on board, in hanging by his arms from the ropes, and in romping with the boys of the ship. He would entice them into play, by striking them with his hand as they passed, and bounding from them, but allowing them to overtake him, and engage in a mock scuffle, in which he used his hands, feet, and mouth. If any conjecture could be formed

from those frolics of his mode of attacking an adversary, it would appear to be his first object to throw him down, then to secure him with his hands and feet, and then wound him with his teeth.

Of some small monkeys on board, from Java, he took little notice, whilst under the observation of the persons of the ship. Once, indeed, he openly attempted to throw a small cage, containing three of them, overboard, because, probably, he had seen them receive food of which he could obtain no part. But, although he held so little intercourse with them when under our inspection, I had good reason to suspect that he was less indifferent to their society when free from our observation; I was one day summoned to the topgallant-yard of the mizen-mast, to overlook him playing with a young male monkey. Lying on his back, partially covered with the sail, he for some time contemplated, with great gravity, the gambols of the monkey, which bounded over him; but, at length, caught him by the tail, and tried to envelop him in his covering. The monkey seemed to dislike the confinement, and broke from him, but again renewed his gambols, and; although frequently caught, always escaped. The intercourse, however, did not seem to be that of equals, for the orang-outang never condescended to romp with the monkey as he did with the boys of the ship. Yet the monkeys had evidently a great predilection for his company; for, whenever they broke loose, they took their way to his resting-place, and were often seen lurking about it, or creeping clandestinely towards him. There appeared to be no gradation in their intimacy, as they appeared as confidently familiar when first observed as at the close of their acquaintance.

But although so gentle when not exceedingly irritated, the orang-outang could be excited to violent rage, which he expressed by opening his mouth, showing his teeth, seizing and biting those who were near him. Sometimes, indeed, he seemed to be driven almost to desperation; and on two or three occasions, committed an act which, in a rational being, would have been called the threatening of suicide. If repeatedly refused an orange when he attempted to take it, he would shriek violently, and swing furiously about the ropes, then return and endeavour to obtain it; if again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams; and then, suddenly starting up, rush furiously over the side of the ship, and disappear. On first witnessing this act, we thought that he had thrown himself into the sea; but, on a search being made, found him concealed under the chains.

I have seen him exhibit violent alarm on two occasions only, when he appeared to seek for safety in gaining as high an elevation as possible. On seeing eight large turtle brought on board, whilst the ship was off the Island of Ascension, he climbed, with all possible speed, to a higher part of the ship, than he had ever before reached; and, looking down upon them, projected his long lips into the form of a hog's snout, uttering, at the same time, a sound which might be described as between the croaking of a frog, and the grunting of a pig. After some time, he ventured to descend, but with great caution, peeping continually at the turtle; but could not be induced to approach within many yards of them. He ran the same height, and uttered the same sounds, on seeing some men bathing and splashing in the sea; and since his arrival in England, has shown nearly the same degree of fear, at the sight of a live tortoise.

Such were the actions of this animal, so far as they fell under my notice, during our voyage from Java; and they seem to include most of those which had been related of the orang-outang by other observers. I cannot find, since his arrival in England, that he has learned to perform more than two feats, which he did not practise on board ship, although his education has been by no means neglected. One of these, is to walk upright, or rather, on his feet, unsupported by his hands; the other, to kiss his keeper. I have before remarked, with how much difficulty he accomplishes the first, and may add, that a well-trained dancing dog would far surpass him, in the imitation of the human posture. I believe, that all the figures given of orang-outangs, in an unpropped erect posture, are wholly unnatural. Some writer states, those orang-outangs which he describes gave "real kisses;" and so words his statement, that the reader supposes them the natural act of the animal. This is certainly not the case with the orang-outang which I have described. He imitates the act of kissing, by projecting his lips against the face of his keeper, but gives them no impulse. He never attempted this action on board ship; but has been taught it by those who now have him in charge.

I shall enter into no speculation respecting his intellectual powers, compared with those of men; but leave the foregoing account of his actions as a simple record of facts, that may be used by other observers, to estimate the rank which he holds in the scale of sagacity.

A Mimic Orang.—Père Carbasson brought up an orang-outang, which became so fond of him, that wherever he went, it was desirous of bearing him company. Whenever, therefore, he had to perform the service of his church, he was under the necessity of shutting it up in his room. Once, however, the animal escaped, and followed the father to the church; where silently mounting the sounding-board above the pulpit, he lay perfectly still till the sermon commenced. He then crept to the edge, and overlooking the preacher, imitated all his gestures in so grotesque a manner, that the whole congregation, unable to suppress their feelings, became convulsed with laughter. The father, surprised and confounded at this unusual conduct on the part of his congregation, severely rebuked them for their irreverence. The reproof had no effect in suppressing their excitement, which gave warmth to the preacher, and he redoubled his reproof both in words and action, which the orang imitated to a nicety, and increased their merriment. A friend of Carbassan at length left his seat, and, stepping up to him, intimated the cause of their improper conduct; and such was the demeanour of the animal, that it was with the utmost difficulty he could himself command his gravity, when he ordered the servants of the church to take him away.

Oyster Opening.—Gemelli Carreri, in his voyage round the world, relates a circumstance concerning the orang-outang, in its wild state, which is indicative of very considerable powers, both of reflection and invention. When the fruits on the mountains are exhausted, they will frequently descend to the sea-coast, where they feed on various species of shell-fish, but, in particular, on a large sort of oyster, which commonly lies open on the shore. "Fearful," he says, "of putting in their paws, lest the oyster should close and crush them, they insert a stone as a wedge within the shell; this prevents it from shutting, and they then drag out their prey, and devour it at their leisure." Milo of old might have saved his life, had he been only half as wise.

Display of Sociability.—A female orang-outang was brought alive into Holland from the island of Borneo, in the year 1776, and lodged in the menagerie of the Prince of Orange. She was extremely gentle, and exhibited no symptoms whatever of fierceness or malignity. She had a somewhat melancholy appearance, yet loved to be in company, and particularly with those persons to whose care she was committed. Oftentimes, when they retired, she would throw herself on the ground, as if in despair, uttering the most doleful cries, and tearing in pieces any article of linen that happened to be within her reach. Her keeper having sometimes sat near her on the ground, she would frequently take the hay off her bed, arrange it by her side, and, with the greatest anxiety and affection, invite him to sit down.

A modest Orang.—M. Palavicini, who held an official situation at Batavia, in the year 1759, had in his house two orang-outangs, a male and female, which were extremely mild and gentle. They were nearly of human stature, and imitated very closely the actions of men, particularly with their hands

and arms. In some respects, they had a degree of bashfulness and modesty, which is not observable in savage tribes of the human race. If, for instance, the female was attentively looked at by any person, she would throw herself into the arms of the male, and hide her face in his bosom.

An Orang phlebotomized.—M. de la Bosse purchased of a negro two orang-outangs, male and female, that were only about a year old. "We had," says he, "these animals with us on shipboard. They ate at the same table with us. When they wanted any thing, they, by certain signs, acquainted the cabin boy with their wishes; and, if he did not bring it, they sometimes flew into a rage at him, bit him in the arm, and not unfrequently threw him down. The male fell sick during the voyage, and submitted to be treated like a human patient. The disease being of an inflammatory nature, the surgeon bled him twice in the arm; and when he afterwards felt himself indisposed, he used to hold out his arm to be bled, because he recollected that he found himself benefited by that operation on a former occasion."

FIG. 3. *Chimpanzee. Simia Troglodytes*, Cuv. *Troglodytes Niger*, DESMAREST.

The chimpanzee, both in face, form, and internal organization, approaches very nearly to the human species. No adult specimen has ever yet reached Europe, the largest having only measured about three feet six inches, and, from the state of its dentition, being evidently immature. There is a strong probability that this is the wild man of the woods mentioned by travellers. He differs from the orang-outang, in wanting an intermaxillary bone, and the last joint of his great toe is perfect. He also possesses the round ligament of the thigh bone: from which it is evident he is more fitted than the orang, for assuming the upright position. His facial angle is only about 50 deg. while that of the other species is 65 deg.

The few young specimens of this animal which have been carried to Europe, evinced a considerable degree of melancholy, and were much more docile and submissive than those orangs whose habits naturalists have described.

The chimpanzee seems entirely confined to the intertropical regions of Central Africa, and perhaps some of the islands in the same latitude. He appears to have been known to the ancients, from a description we have of large apes, found in an island on the western coast of Africa, by Hanno, a Carthaginian admiral, three hundred and thirty-six years previous to the Christian era. He says—"There were many more females than males, all equally covered with hair on all parts of the body. The interpreters called them *gorilbés*. On pursuing them, they could not succeed in taking a single male; they all escaped with astonishing swiftness, and threw stones at us; but we took three females, who defended themselves with so much violence, that we were obliged to kill them; but we brought their skins, stuffed with straw, to Carthage."

Working Apes.—We are told by Francois Pyard, that, in the neighbourhood of Sierra Leone, on the coast of Africa, apes are to be found of a robust structure of body, which walk upright, are strong and active, and are sometimes trained to perform menial offices. They have been taught to pound substances in a mortar, and fetch water from the river in jugs. But unless these are immediately taken from them on their arrival at the door, they let them fall; and, when they see them lying broken in pieces, they utter a lamentable kind of cry.

Schouten's account of certain apes which he saw, so far agrees with that of Pyard; for he says he has seen them trained to various kinds of labour; namely, to rinse out glasses, carry liquor about to a company at table, turn a spit, &c. It seems extremely probable that these are the young chimpansé.

Proofs of Intelligence.—Speaking of the chimpanzee of Africa, M. De Grandpré says,—"His sagacity is extraordinary; he generally walks upon two legs, supporting himself with a stick. The negro fears him, and not without reason, as he sometimes treats him very roughly." M. De Grandpré saw, on board of a vessel, a female chimpansé, which exhibited wonderful proofs of intelligence. She had learnt to heat the oven; she took great care not to let any of the coals fall out, which might have done mischief in the ship; and she was very accurate in observing when the oven was heated to the proper degree, of which she immediately apprized the baker, who, relying with perfect confidence upon her information, carried his dough to the oven as soon as the chimpansé came to fetch him. This animal performed all the business of a sailor, spliced ropes, handled the sails, and assisted at unfurling them; and she was, in fact, considered by the sailors as one of themselves. The vessel was bound for America; but the poor animal did not live to see her arrival, having fallen a victim to the brutality of the first-mate, who inflicted a very cruel chastisement upon her, which she had not deserved. She endured it with the greatest patience, only holding out her hands in a suppliant attitude, in order to break the force of the blows she received. But from that moment she steadily refused to take any food, and died on the fifth day from grief and hunger. She was lamented by every person on board, not insensible to the feelings of humanity, who knew the circumstances of her fate.

FIG. 4. *Long-armed Ape*, or *Gibbon. Hilobates lar*, Cuv. *Pithecus lar*, DESMAREST.

The gibbon is distinguished by the great length of its arms, which reach to the ground, when the animal is standing upright. Its face is flat, tawny, and greatly resembling that of man, surrounded by a circle of gray hairs, which increases the singularity of its aspect. Its eyes are large and deep sunk, ears round and naked, much like those of the human race. The body is covered all over, except the hinder parts, with black rough hair. It has no tail.

The gibbon is of a mild and tractable disposition, and feeds on fruits, leaves, and the bark of certain trees. It is a native of the East Indies, and common in Sumatra, Moluccas, and the coast of Coromandel. It varies in size, from three to four feet in height.

The following anecdote, in all probability, applies to this species, as the gibbon, in great numbers, inhabits the districts where it happened.

United Retaliation.—The famous Tavernier tells us, that, returning from Agra with the English president to Surat, they passed within four or five leagues of Amenabad, through a little forest of mangoes. "We saw here," says he, "a vast number of very large apes, male and female, many of the latter having their young in their arms. We were each of us in our coaches; and the English president stopt his, to tell me, that he had a very fine new gun; and knowing that I was a good marksman, desired me to try it, by shooting one of the apes. One of my servants, who was a native of the country, made a sign to me not to do it; and I did all that was in my power to dissuade the gentleman from his design, but to no purpose; for he immediately levelled his piece, and shot a she ape, who fell through the branches of the tree on which she was sitting, her young ones tumbling at the same time out of her arms upon the ground. We presently saw that happen, which my servant apprehended; for all the apes, to the number of about sixty, came immediately down from the trees, and attacked the president's coach with such fury, that they must infallibly have destroyed him, if all who were present had not flown to his relief, and by drawing up the windows, and posting all the servants about the coach, protected him from their resentment. I must confess, I was not a little afraid, though they did not offer to meddle with me, because they were very large, and of incredible strength; and their fury was so great, that they pursued the president's coach for nearly three leagues."

Pugnacious Community.—Bindrabund, a town of Agra, in India, is in high estimation with the pious Hindoos, who resort to it from the most remote parts of the empire, on account of

its being the favourite residence of the god Krishna. The town is embosomed in groves of trees, which, according to the account of Major Thorn, are the residence of innumerable apes, whose propensity to mischief is increased by the religious respect paid to them, in honour of Hunaman, a divinity of the Hindoo mythology, wherein he is characterized under the form of an ape. In consequence of this degrading superstition, such numbers of these animals are supported by the voluntary contributions of pilgrims, that no one dares to resist or ill treat them. Hence, access to the town is often difficult; for, should one of the apes take an antipathy against any unhappy traveller, he is sure to be assailed by the whole community, who follow him with all the missile weapons they can collect, such as pieces of bamboo, stones, and dirt, making, at the same time, a most hideous howling. Of the danger attending a rencounter with enemies of this description, a melancholy instance occurred in the year 1808. Two young cavalry officers, belonging to the Bengal army, having occasion to pass this way, were attacked by a body of apes, at whom one of the gentlemen inadvertently fired. The alarm instantly drew the whole body, with the fakeers, out of the place, with so much fury, that the officers, though mounted upon elephants, were compelled to seek their safety in flight; and, in endeavouring to pass the Jumna, they both perished.

FIG. 5. *Barbary Ape. Innus Sylvanus*, CUV. *Macacus Innus*, LUCEPEDE.

The Barbary ape is very generally diffused throughout Africa, Arabia, India, and Peru; some are to be found on the rock of Gibraltar, to which place they were introduced from the opposite coast. They are so common in Barbary, that they may, in almost all wooded situations, be seen in hundreds. They are extremely wicked and mischievous; and, in India, often commit robberies on the peasantry going and returning to market: they assemble in vast numbers, and deprive them of their provisions. The principal food of this species is vegetables and fruit.

Audacious Robbers.—A striking instance of the audacity of the ape in attacking the human species, is related by M. Mollien, in his *Travels in Africa*. A woman going with millet and milk to a vessel, from St. Louis, which had been stopped before a village in the country of Golam, was attacked by a troop of apes, from three to four feet high: they first threw stones at her, on which she began to run away; they then ran after her, and, having caught her, they commenced beating her with sticks, until she let go what she was carrying. On returning to the village, she related her adventure to the principal inhabitants, who mounted their horses, and, followed by their dogs, went to the place which served as a retreat to this troop of apes. They fired at them, killed ten, and wounded others, which were brought to them by the dogs; but several negroes were severely wounded in this encounter, either by the stones hurled at them by the apes, or by their bites; the females especially were most furious in revenging the death of their young ones, which they carried in their arms.

Familiar Apes.—D'Obsonville, speaking of the sacred haunts of apes in different parts of India, says, that in the course of his travels through that country, he occasionally went into the ancient temples, in order to rest himself. He noticed always that several of the apes, which abounded there, first observed him attentively, then looked inquisitively at the food which he was about to take, betraying by their features and gestures, the great desire which they felt to partake of it with him.

In order to amuse himself upon such occasions, he was generally provided with a quantity of dried pease: of these he first scattered some on the side where the leader stood (for, according to his account, the baboons always obey some particular one as their leader,) upon which the animal gradually approached nearer, and gathered them eagerly up. He then held out a handful to the animal; and, as they seldom see any person who harbours hostile intentions against them, the baboon ventured slowly to approach, cautiously watching, as it seemed, lest any trick might be played him. At length, becoming bolder, he laid hold, with one of his paws, of the thumb of the hand in which the pease were held out to him, while, with the other, he carried them to his mouth, keeping his eyes all the while fixed upon those of M. d'Obsonville. "If I happened to laugh," he observes, "or to move myself, he immediately gave over eating, worked his lips, and made a kind of growling noise, the meaning of which was rendered very intelligible to me by his long canine teeth, which he occasionally exhibited. If I threw some of the pease to a distance from him, he sometimes seemed pleased to see other apes pick them up; though, at other times, he grumbled at it, and attacked those who approached too near to me. The noise which he made, and the apprehensions he showed, though they might perhaps proceed, in some measure, from his own greediness, evidently proved, however, that he feared I might take advantage of their weakness, and so make them prisoners. I also observed, that those whom he suffered to approach the nearest to me, were always the largest and strongest of the males; the young and the females he always obliged to keep at a considerable distance from me."

Sociability of the Ape.—It was with much delight that M. d'Obsonville witnessed the care and tenderness which the female apes evinced towards their young in a completely wild state. They watched them with maternal affection, and, at the same time, kept them under great subordination. He saw them suckle their young, caress them, clean them of the vermin they had about them, and, after putting them on the ground, watch their sports with great apparent satisfaction. The little ones threw each other down, chased one another, and gambolled like little children. When any of them were guilty of a malicious trick, the mother laid hold of the aggressor by the tail, with one of her paws, and with the other boxed his ears. When she quitted her hold, some of them ran off to a distance; and, when they found themselves out of danger, they approached again with suppliant gestures, although they were soon again guilty of similar misbehaviour.

FIG. 6. *Pigmy Ape. Innus Sylvanus.* (See description of Fig. 5.)

FIG. 7. *Red-tailed Ape. Hapale Œdipus*, CUV. *Jacchus Œdipus*, DESMAREST.

This is a species of uncommon beauty. Its size is about that of a large squirrel. The upper parts of the body are of a pale reddish brown, and the under parts and limbs are white. The face is black; the hair on the head white, long, loose, and spreading over the shoulders like a mantle; the lower parts of the back, and upper half of the tail, are of a deep orange red; the remainder of the tail black; the claws small and sharp. It is an active and lively animal; its voice is a kind of soft whistle, not unlike the note of a bird. Edwards says, that, when gamboling about a room, it often assumes the appearance of a lion in miniature, from the manner in which it carries its tail over its back. It is a native of Guiana.

FIG. 8. *Striated Ape. Hapale Jacchus*, CUV. *Jacchus Vulgaris*, DESMAREST.

The striated jacchus is one of the smallest of the monkey tribe, its head and body being hardly twelve inches in length; it has a very long tuft of ash-coloured hairs before and behind the ears; its face is naked, and of a dull flesh colour; its ears large, and shaped very like the human; the body is beautifully marked with alternate transverse bars of ash colour and black. Shoulders brownish red; tail long, bushy, and marked with alternate rings of ash colour and black; its nails are sharp, and its fingers resemble the claws of a squirrel.

This beautiful little animal is a native of Brazil, and feeds on fruits, vegetables, insects, and snails, and is said to be fond of fish.

United Care.—We have an amusing account of the united care and attention paid by two striated monkeys to their offspring, born in the menagerie of the *Jardin des Plantes* at Paris. On the 27th April, 1819, the female brought forth three young ones, a male and two females. They instantly attached themselves to their mother, embracing her closely, and hiding themselves in her fur. However, previously to their sucking, she cruelly deprived one of them of life, and cut its head off. The two others took the breast, and from that moment the mother bestowed on them the natural attention of a parent, and her cares were shared by the father. When the female was fatigued by carrying the young ones, she would approach the male, and send forth a little plaintive cry, and immediately the latter would take them with his hands, and place them under him, or on his back, where they held fast, and thus he would carry them about until they showed uneasiness for want of suck, when he returned them to the female, who, after satisfying their wants, got rid of them again as soon as possible. The principal burden of the care of the young devolved upon the male. The mother did not evince for them that degree of tenderness and affection, so usual in the females of most species.

PLATE CLXXXI.—ORNITHOLOGY.

LAND BIRDS. Order GALLINÆ. Genus PHASIANUS, PHEASANT.

FIG. 1. *Common Pheasant. Phasianus Colchicus*, LINN. and CUV

It is almost needless to descant upon the plumage of this elegant and well-known bird: but it is necessary that it should be described, as it serves to exemplify the species: its usual length, including its tail, is about three feet: its weight nearly three pounds: its beak is pale yellowish horn-colour: irides yellow: the cheeks are covered with a scarlet velvety down, minutely spotted with black: the head and neck are of a changeable golden hue, with blue and violet reflections: the sides of the head near the occiput are adorned (at least in the courting season) with a tuft of ear-like golden-green feathers: the lower part of the neck, the breast, the belly, and the sides, are of a most brilliant chestnut-purple, the whole of the feathers being bordered with black, with violet hues: the abdomen and the under tail-coverts are of a reddish brown colour: the wings are brown-purple, spotted with yellowish white: the quills are brown, with transverse stripes of reddish white: the two middle tail-feathers are very long and arched; their centre is olive-gray, varied with transverse black bands, and their margins are of a chestnut-purple: the rest of the tail-feathers are similar in colour, but much shorter: the legs are dusky, furnished with a strong membrane between the toes, and a blunt spur on the tarsi.

The female is less in size: the general colour brown, variegated with gray, rufous, and dusky: the region of the eyes is covered with feathers; tail much shorter than in the male, but barred as in him; old females often attain the plumage of the male, and possess a hard tubercle on the tarsi in the place of the spur of the male. Young birds have the plumage of an uniform gray, approaching greatly to that of the female.

This bird is another instance of the changes animals undergo when they lose their native freedom, and are under the dominion of mankind. It is greatly subject to variation, and in addition to that, it will propagate with other species, and produce hybrids: the first variety worth noticing is the Variegated Pheasant, which has its plumage white, varied in an infinity of ways with that of the first described; in other respects similar to that bird. The next is entirely white, with a slight tracing of the characters proper to the species.

Pheasants breed on the ground like Partridges, the female laying from eight to a dozen eggs, in a sort of rough hole formed by scratching a few dried vegetables together: the young follow the mother like chickens, as soon as hatched: wood and corn lands seem necessary to their existence. They bear confinement very well, and the female produces a great many eggs in that state, and will sometimes sit upon them if not disturbed by the male, which is often the case: on this account the eggs are generally put under a common hen to be hatched, and by this means a supply is kept up. If it were not for this and the exertions of gentlemen of property, it is probable the breed would become extinct in a few years: the demand for them at the tables of the luxurious, and the easy mark they offer to the sportsman, would soon complete their destruction.

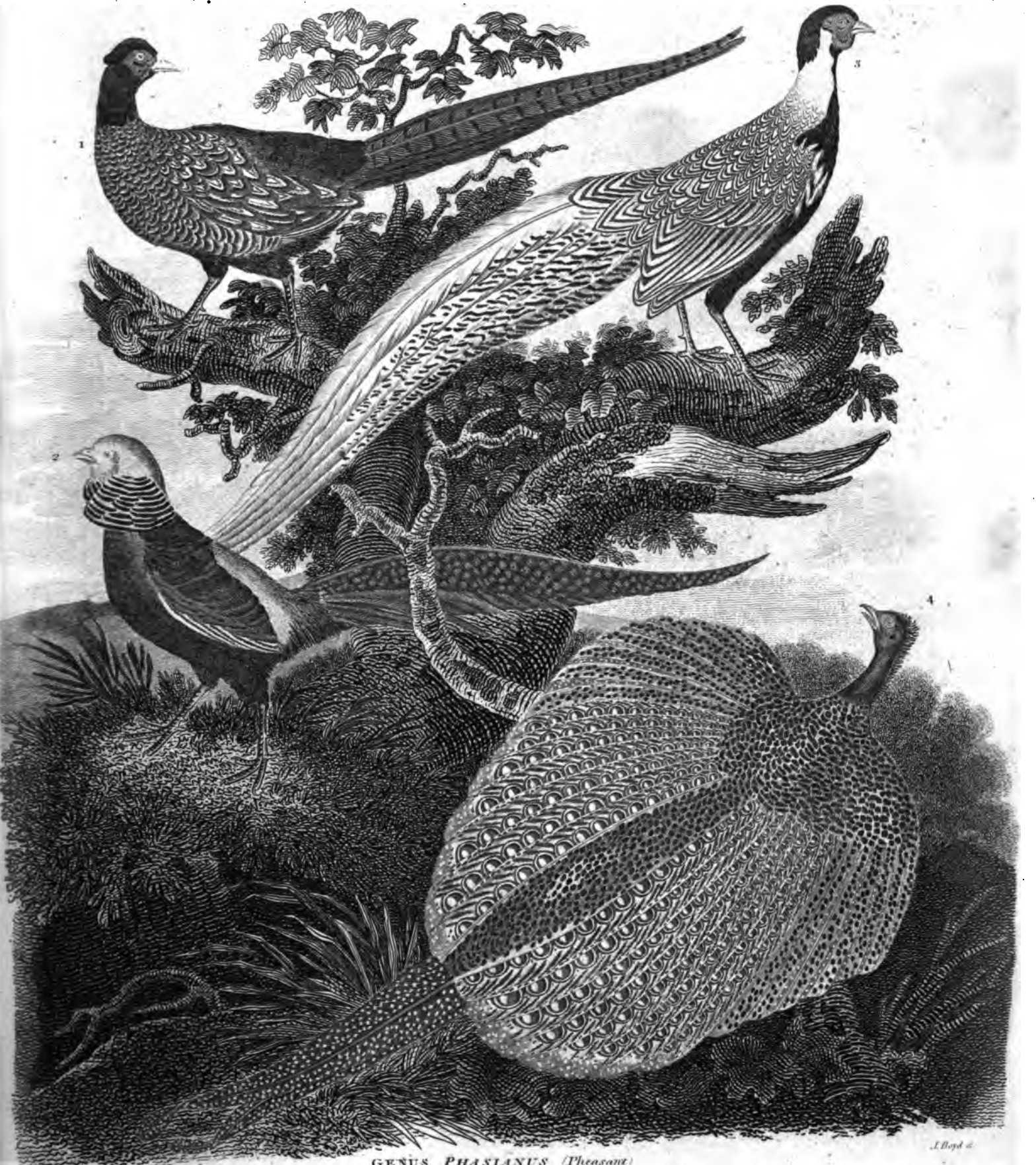
The Pheasant is in many respects a foolish bird. On being roused, it will often perch on a neighbouring tree, where its attention will be so fixed on the dogs as to suffer the sportsman to approach very near. At the time they perch, they most frequently crow, or make a chuckling noise called cocketing. The hens on flying up utter one shrill whistle, and then are silent. Poachers avail themselves of these notes to discover the roosting places, where they shoot them with the greatest certainty; or, where the woods are well watched, they light a number of brimstone matches at the end of a pole, and the moment the sulphurous fumes reach the birds, they drop off the perch. Other means are also adopted for catching them with nooses made of wire, horse-hair twisted, or even with briars set in the form of a noose, at the verge of a wood. The birds entangle themselves in these as they run, morning and evening, into the adjacent fields to feed. Foxes also destroy great numbers, particularly females when sitting on their nest.

It has been asserted that Pheasants are so shy as not to be tamed without great difficulty; but where they are in the constant habit of being attended in their coverts by a keeper, they will come to feed the instant they hear his whistle; and will follow him in flocks, and scarcely allow the peas to run from his bag into the troughs placed for the purpose, before they begin to eat: those that cannot find sufficient room at one trough follow him with the same familiarity to others. They are fond of corn, but will often feed on the wild berries of the woods, and on acorns: the young are fed with the pupæ of ants; they are also fond of other insects and worms.

It is generally supposed that Pheasants had their origin in Asia, having been introduced into Europe from the banks of the Phasis, a river of Colchis, about the time of the Argonauts: however, they are now found in all the southern parts of that continent, and over the greatest part of Asia, but not in Africa or the New World. They are abundant in the southern parts of England, but rare in the north and in Scotland.

FIG. 2. *Gold Pheasant. Phasianus Pictus*, LINN. and CUV.

The Gold or Painted Pheasant is perhaps the most beautiful of the genus: its total length is about two feet nine inches: beak and irides yellow: the upper part of the head is adorned with a beautiful glossy yellow crest, composed of loose disunited feathers, resembling rich silk: cheeks nearly bare, and flesh-coloured: the sides of the head livid: the feathers of the occiput are bright orange-colour, square at the ends, and barred with black lines; they are long, and can be erected at pleasure, like those on the neck of a Cock: the feathers of the nape of the neck are of a beautiful golden green, with a black stripe at their tips: the back, rump, and upper tail-coverts, are bright lively yellow, the latter tipped with crimson-red: the throat is reddish yellow: the under part of the neck, the breast, and the rest of the under parts of the body, are of a rich scarlet: the scapulars are deep blue, changing to brilliant violet: the secondary feathers and wing-coverts are varied with different tints of chestnut and brown: the quills are brown, marked with reddish; their outer edge is also of the latter colour: the tail is very long and cuneiform; the two middle feathers being nearly two feet in length, and the lateral ones very short; the former are varied and marbled with chestnut and black, and



GENUS PHASIANUS (Pheasant)

Syd. Edwards del. J.Boyd d.

1.P. Colchicus COMMON P. 2.P. Pictus GOLD P. 3.P. Nycthemerus SILVER P. 4.P. Argus ARGUS P.

the latter are adorned with oblique stripes of those colours; the rest of the upper parts rich scarlet: the feet are bright yellow: the tarsi are armed with a spur.

The female is less than the male, and wants the gay colours of that sex: the feathers on the head are elongated, and can be elevated at will: the upper parts of the head and the neck, the back, the rump, the wing-coverts, and the upper coverts of the tail, are brownish red: the throat is whitish: the rest of the under part is clear brown, or yellowish, varied with brown spots: the feathers of the wings and tail are of the same colour as the back, varied with transverse black stripes: the tail is much shorter than in the male; its two middle feathers are barred with black, and the rest irregularly spotted with that colour: the beak and feet are yellow: the irides dusky yellow.

The native place of this species is China, where it is called *Kin-ki:* it has been common in Europe for a long time, and appears to be very hardy: it bears confinement well, and will breed readily in that state: its eggs resemble those of the Guinea Pintado; they are redder than those of the Pheasant. The food consists of rice, hemp, wheat, or barley; it will also eat red cabbages, herbs, leaves, fruits, especially plums, and insects; the latter form its favourite meal, and the difficulty of procuring a sufficiency of these is one cause of the many diseases it is subject to. Its flesh is remarkably good, and is said to exceed that of any other Pheasant. The female deposits her eggs about March, and the young are hatched in twenty-three days: the young differ in their plumage from the old birds: during the first year they are of a yellowish gray, varied with transverse brown lines; the next year the sexes may be discriminated, the males being more brilliant in colour; and in the third year the plumage attains its utmost brilliancy. Old females sometimes put on the plumage of the males, like many other gallinaceous birds, but this is rare: they will also breed with the common Pheasant, as has been already noticed in the account of that bird.

FIG. 3. *Silver Pheasant. Phasianus Nycthemerus*, LINN. and CUV.

The male of this species is nearly three feet in length: the beak and irides yellow: sides of the head covered with a carunculated, crimson, bare skin, which is capable of distension; it is prolonged above the eyes in form of a comb, and falls on each side the under mandible of the jaw, like two wattles: the head is ornamented with a long crest of loose webs; it falls behind, and is of a deep purple: the upper parts of the body are white, each feather marked with black stripes parallel to the margin; this forms an agreeable contrast to the plumage of the under parts of the neck and body, which is of a purple-black: the tail is wedge-shaped; the feathers white, obliquely striated with black, except the two middle ones, which are plain white: the legs are red, furnished with a white spur. The female is smaller than the male: the beak and the irides are yellowish brown: the eyes surrounded by a red skin, which is narrower and less bright than in the male: the top of the head is somewhat crested and brown: the throat and cheeks are whitish: the neck, the breast, the back, the rump, the wing and upper tail-coverts, rufous brown: the lower part of the breast, the belly, the abdomen, and the under tail-coverts, are dull white, irregularly varied with brown, and crossed with transverse black bands: the quills are dusky; the secondaries like the back; those nearest the body dotted with white: the two middle tail-feathers, shorter than in the male, brown; the others brown and white mixed, and striped obliquely with black: the feet are red.

The female deposits her eggs, which vary in number from eight to fourteen, about the month of April; they are reddish yellow, varied with white, and sprinkled with a few small brown spots, and are hatched in twenty-six days: the young are reared with less difficulty, and they are more easily tamed than the common Pheasant. During the courting season, and also when inflamed by rage, the naked skin on the head of the male is of a deep crimson.

The native place of these birds is the northern parts of China, from whence they have been introduced into all parts of Europe: they are common in aviaries in England, and bear confinement well.

FIG. 4. *Argus Pheasant. Phasianus Argus*, LINN. and CUV.

The male of this rare but beautiful species measures five feet six or eight inches from the beak to the tip of the tail: its body is about the size of that of the Gigantic Cock: the beak is pale yellow: the fore-part of the head and the beginning of the throat are covered with a granulated skin of a fine scarlet colour: the irides are orange: round the eye the skin is dusky: the forehead, the top of the head, and the occiput, are adorned with small velvety plumes of a fine changeable blue colour, forming a slight crest on the hind head: the lower part of the neck, the breast, the belly, and the thighs, are of a reddish brown, each feather being irregularly spotted with deep yellow and black: the top of the back and the lesser wing-coverts with black spots, edged with small stripes of ochrey yellow: part of the back, the rump, and the upper tail-coverts, are bright yellow-ochre, spotted with brown, resembling the skin of the leopard: the wings, which consist of very large feathers, are the most remarkable part of the bird; the primaries have their shafts bluish, and the secondaries pure white; the ten first quills have their outer webs dull white, sprinkled with black spots, surrounded by a circle of yellow, shading into a second circle of grayish: the inner webs are twice the width of the outer ones; they are marked with short rays, which unite in a broad longitudinal band; they are rufous, with small white points, as big as the tares; the rest of the web is yellowish, with black spots, encircled with brown: the remainder of the quills have their inner webs grayish white, with black spots, edged with brown: the outer webs are adorned with a row of large eyes, arranged parallel to the shaft; these are of different tints of olive-green, with a small spot of white on the lower part, and surrounded with a deep black circle; the feathers have a ground colour of dull white, varied with dusky undulated rays: the eyes are nineteen in number on the longest feathers, and fifteen on the shortest, gradually diminishing in number; the feathers themselves are nearly three feet long: the tail consists of twelve feathers, the two middle ones being about four feet in length; the next scarcely two, gradually shortening to the outer ones, which are but twelve inches; they are of a deep chestnut-brown, dotted with white; the two middle feathers have round white spots, encircled with black, on their outer webs, and irregular brown spots, surrounded with dusky, on their inner; the extremity of them is spirally twisted, and tipped with dull white: the lower belly and vent dusky, irregularly varied with brown: legs greenish ash: tarsi without spurs. The young males are dull brown, spotted and irregularly varied with reddish yellow, brown, and black: before the second moult there is no appearance of eyes on the secondaries, the whole of the quills being nearly black: the primaries with brown spots, and the secondaries with yellow-brown and zigzag black spots on their outer web, and plain brown on their inner: the rump does not possess the beautiful spotted appearance, and the two middle tail-feathers are plain. After the second moult the whole of the colours begin to make their appearance with more regularity; at the third, the back and the rump are covered with yellowish red feathers, spotted with chestnut: the two middle tail-feathers increase in length: the quills are regularly spotted, and the eyes on the secondaries make their appearance. It is not till after the fourth moult is completed that the bird attains its full plumage.

The female, which is described by Temminck, is in general as large as the male in the body, but considerably shorter, owing to the great disparity in the length of the two middle tail-feathers, which scarcely exceed eight inches, whereas in the

male they are nearly four feet in length: again, the secondaries in the female are not above four inches long, but in the male almost three feet: the sides of the head and the top of the neck are covered with a rugose skin: the top of the head and the occiput are covered by a very short cottony down: the feathers on the hind part of the neck are shaded with gray-brown and bright gray; they have disunited webs: the lower part of the neck, the breast, and the top of the back, are of a red-chestnut: the back, the rump, the lesser wing-coverts, and those of the tail, are yellowish brown, transversely striped with zigzag black bands of various widths: the quills and the feathers at the bend of the wing have the webs of a deep red, spotted with black: the secondaries, which are so remarkable in the male, in this sex are dusky brown, irregularly marked with small yellow-ochre spots of various forms, resembling the characters made use of by the Chinese: the feathers of the tail are of a chestnut-brown, varied with black spots and stripes: the tail itself is composed of two parallel planes: the skin on the neck and the feet is of the same colour as in the male.

According to Marsden, this bird is a native of the woods of Surinam; it is also found in the south of India, and particularly the kingdoms of Pegu, Siam, and Cambodia, and very abundantly about Malacca: in the former place it is called *coo-ow*. It has a great antipathy to the light, being very dull during the day; but when in the dark, is very lively, and sometimes makes its note or call, from which it takes its Sumatran name: its voice is rather plaintive, and not harsh as in the Peacock. It is extremely difficult to be kept alive for any considerable time after catching it in the woods; never for more than a month.

PLATE CLXXXII.—ORNITHOLOGY.

LAND BIRDS. Order PICÆ. Genus RAMPHASTOS. Genus BUCEROS. Genus BUPHAGA. Genus CROTOPHAGI. Genus GLAUCOPIS.

Genus RHAMPHASTOS.

The birds of this genus first became known to naturalists on the discovery of South-America, to the warmer regions of which they appear, in general, to be confined. Like the Hornbills, they are distinguished by the enormous size of their beaks, which, in some species, is nearly equal to that of the whole body. It is however of a very light substance, and, in the living bird, is even compressible between the fingers. Both mandibles are serrated in an outward direction; the tongue is of a highly singular form, representing the appearance of a very narrow lanceolate feather, being of a somewhat horny or cartilaginous nature, and divided on each side into innumerable short and close-set fibres; in consequence of which structure it was described by some of the old writers as a real feather, supplying the place of a tongue. The orbits of the eyes are generally bare. The Toucans are supposed to feed principally on fruits; but, in a state of captivity, have been observed to eat animal food of various kinds. They deposit their eggs, which are usually two in number, in the hollows of trees, on the surface of the decayed wood.

The species at present known are not very numerous, and of those usually considered as distinct, it is not improbable that some may be mere sexual differences.

FIG. 1. *Brasilian Toucan. Ramphastos Piscivorus*, LINN. and CUV.

This bird is faithfully described, from a living specimen, by Edwards, who compares its size to that of a common tame pigeon, and its shape to that of a magpie, but with a larger head, and a much shorter tail in proportion.

"The bill, from the forehead, or the angles of the mouth, to the point, is six inches long; its height or depth, where deepest, is somthing more than two inches; from side to side, near the head, one inch thick; the upper mandible is of a pale yellow greenish colour; the sides, near the toothed edges, have each a long cloud of orange-colour, transversely barred with black or dusky lines, which pass through the divisions of the bill a little way into the sides of the lower mandible; the lower mandible is of an exceeding fine blue colour, faint towards the head, stronger towards the point; the point itself, of both upper and lower mandible, for above an inch in depth, is of a fine scarlet colour; the bill is very much compressed sideways, and ends in a perfect edge along its upper part; the edge of the lower mandible is somewhat less ridged; the bill is bowed towards the point, and has a large cavity above the roof of the mouth; the nostrils are invisible, being situated pretty near together in the upper part of the bill, just in the line which passes between the bill and the forehead; the eyes are of a dark hazel-colour, encompassed round with a bare skin of a greenish yellow colour, having seams or creases running in a broken manner round the eye, and, reaching to the bill, there passes all round the basis of it a narrow black line; the top of the head, upper side of the neck, back, wings, belly, thighs, and tail, are of a black colour, the wings only having a shining changeable lustre; the sides of the head, throat and breast, are white, or rather cream-colour; and between the white on the breast and the black belly, there is a crescent of fine red, whose horns point upwards on the sides, and this is softened both above and beneath into the colours it joins with; the rump, or coverts on the upper side of the tail, are white; the feathers beyond the vent, and those that cover the under side of the tail, are of a pale red; the legs, feet, and claws, are of a light blue or violet colour."

Edwards adds, that, after death, the colours of the bill were totally lost or obscured, and the bare space round the eyes turned black.

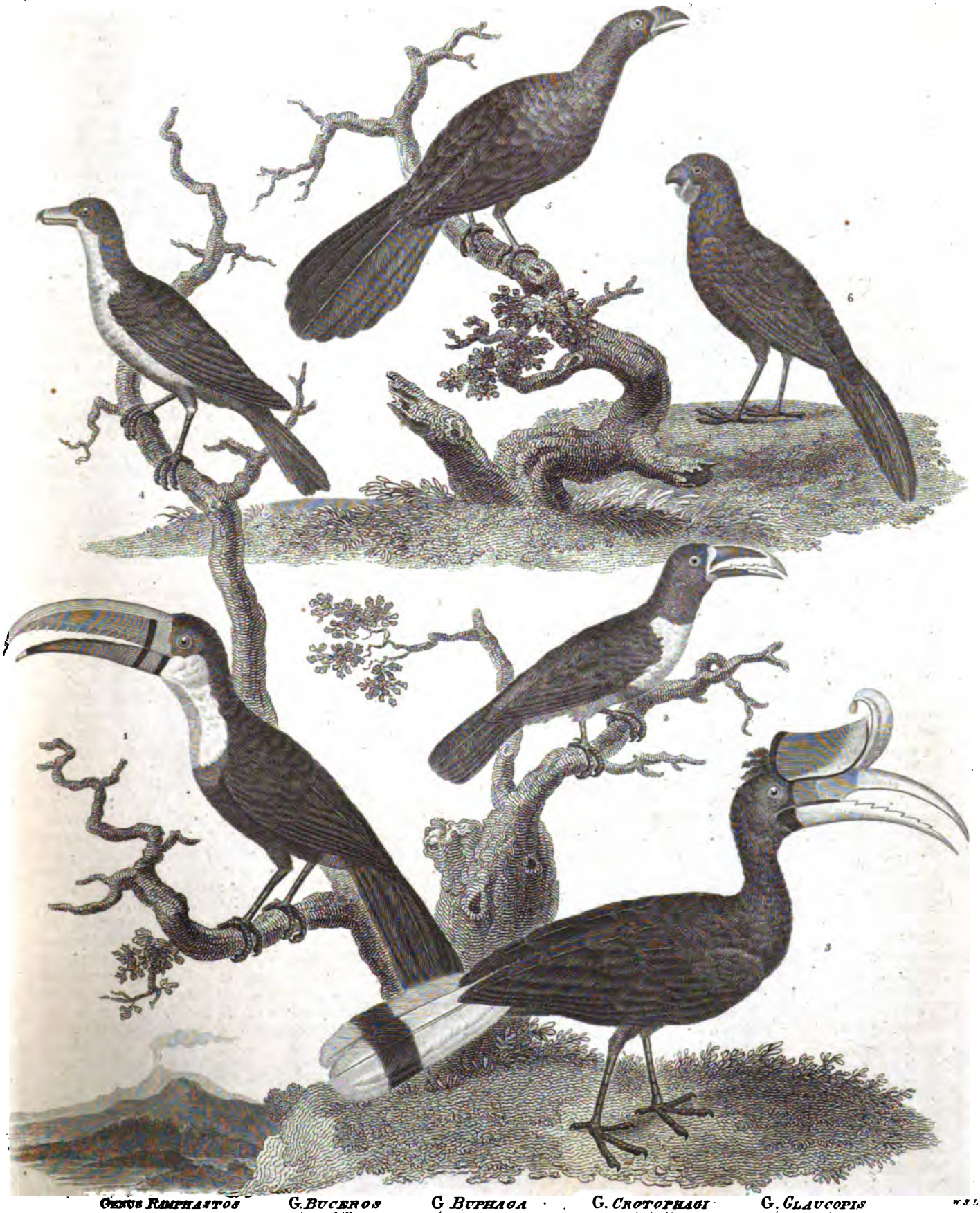
This bird is a native of Brazil.

FIG. 2. *Aracari Toucan. Ramphastos Aracari*, LINN. and CUV.

Total length near seventeen inches; of the bill about four inches; upper mandible white, marked along the top by a longitudinal black stripe; lower mandible black; head and neck deep black, with a chestnut-coloured spot behind each ear; back, wings, and tail, dull green; breast, belly, and sides, pale yellow, the upper part of the breast reddish, and across the middle of the belly a moderately broad red bar; rump of the same colour; tail lengthened and considerably cuneated; legs and feet greenish. This species is known to vary, in having the wings and tail black, a black roundish spot on the breast, and a slight bar of the same colour on the abdomen. In the female the head and neck are brown instead of black. Native of South America, particularly of Brazil and Surinam.

Genus BUCEROS.

The birds of this remarkable genus may be considered as holding the same rank in the old continent with the Toucans in the new. Like the Toucans they are distinguished by the enormous size of their beaks, which, in most species, are rendered still more extraordinary by the addition of a large prominence or appendix seated on the upper mandible, differing in shape in the different species. The Hornbills may be said to be both carnivorous and frugivorous, feeding not only on various berries and other vegetable substances, but also on any putrid animal substances, and not unfrequently on many of the smaller kind of living animals, as mice, birds, &c. but perhaps principally on insects. Their large bills are of much less real than apparent strength, the substance being not solid, but of a cancellated internal structure; the mandibles are serrated in an outward direction, and the serratures are often irregular, owing to the injury the bill occasionally receives during its employment in seizing on various vegetable and animal matters. The Horn-



GENUS RAMPHASTOS (Toucan) 1.R. *Piscivorus*_ 2.R. *Arcuatus*. | G. BUCEROS (Hornbill) 3.B. *Rhinoceras*. | G. BUPHAGA (Beef Eater) 4.B. *Africana*. | G. CROTOPHAGI (Ani Bird) 5.C. *Major*. | G. GLAUCOPIS (Wattle Bird) 6.G. *Cinereus*.

bills vary much in the appearance of the bill during the different periods of their age: the process or appendix not exhibiting its genuine form till the full growth of the bird; a circumstance which, added to the difference between the males and females, often causes great difficulty in the determination of the species.

FIG. 3. *Hornbill. Buceros Rhinoceros*, LINN. and CUV.

This, which is perhaps the most remarkable of all the species yet known, is well described and figured in Monsr. Levaillant's work on the rarer birds of India and America. Monsr. Levaillant however is mistaken in supposing that the bill alone had hitherto made its appearance in modern collections, since a very fine and complete specimen existed in the Leverian Museum, and which was long ago figured in the Naturalist's Miscellany. Monsr. Levaillant had the good fortune to contemplate this species in a living state, a specimen having been brought, during his residence at the Cape of Good Hope, from the island of Java in the East Indies, its native residence. The general size of the Rhinoceros Hornbill is that of a hen turkey, but its shape is more slender in proportion: the neck is of a moderate length, and the tail slightly cuneated; the colour of the whole bird is black, except the lower part of the abdomen and tip of the tail, which are white: the bill, which is enormous in proportion to the bird, measures about ten inches in length, and is of a slightly curved shape, sharp-pointed, serrated in a somewhat irregular manner on the edges, and furnished at the base of the upper mandible with an extremely large process, continued for a considerable space in a parallel direction with the bill, and then turned upwards in a contrary direction, or in the manner of a reverted horn: this process is divided into two portions by a longitudinal black line, the part above the line being of a bright red, the part below yellow, and the back part or rising base, next the head, black: the bill itself is of similar colour with the process, being black at the base, the remainder yellow, tinged with bright red towards the base: the legs are short, strong, and of a pale yellow colour. In the specimen described by Monsr. Levaillant, the abdomen was entirely black; the tail, as in the above described specimen, tipped with white, and the whole plumage exhibited a slight bluish gloss when exposed to a strong light: the eyes were blackish; the eye-lashes long, black, and flattish. This bird was of a timid disposition, endeavouring to conceal itself from view, and of a dull and heavy appearance. It did not walk, but hopped along in the manner of a crow. The only appearance of liveliness which it exhibited was when its food was brought by the person who had the care of it: at such times it ran forwards with extended wings, opening its bill and uttering a slight scream of joy. It was fed with biscuit steeped in water, flesh either raw or dressed, rice, pease, &c. Monsr. Levaillant one day offered it some newly killed small birds which he had shot, and which it readily devoured entire, after bruising them for a considerable time in its bill. It was said also, during its voyage from India, to have always pursued rats and mice whenever it perceived them, though it never was nimble enough to catch one. Its monstrous bill, which at first appears so formidable a weapon, is by no means such in reality; and Monsr. Levaillant assures us that he several times put his hand into the bill without feeling the slightest pain, though the bird exerted all its endeavours to wound it. Monsr. Levaillant adds, that the Hornbills in general are, in his opinion, naturally carnivorous, all those which he observed in Africa feeding on serpents, lizards, insects, &c. and sometimes on carrion.

FIG. 4. *Beef-eater. Buphaga Africana*, LINN. and CUV.

The bird which constitutes the present genus is an inhabitant of the hotter parts of Africa, and is said to be frequent in Senegal, where its chief food consists in the larvæ of Oestri or Gad-Flies, which it picks out of the skin of the larger cattle, thus delivering them from the trouble occasioned by these noxious insects. It is for this reason that the generic name of Buphaga has been applied.

The African Ox-Pecker was observed by Monsr. Adanson during his residence in Senegal, and a specimen was by him communicated to Monsr. Brisson, who has, with his usual accuracy, described it in his Ornithology. Its size is not larger than that of a Lark, measuring about eight inches and a half in length: its colour is rufous-brown above, and dull yellowish-white beneath: the bill is nearly an inch long, and of a yellowish colour with a red tip: the tail is cuneated, all the feathers being pointed at the end: the legs and claws are brown.

Monsr. Levaillant, who observed this bird in the country of the Greater Namaquas, informs us that it is usually seen in small flocks of six or eight together. It is extremely wild or shy, and will not easily admit of a near approach: the strength of its beak is very great, and well adapted to the purpose of extracting larvæ from the skin of cattle; but it also feeds on various other insects. The female differs from the male in being rather smaller, and in having the bill of a paler cast.

FIG. 5. *Ani-Bird*, or *Keel-Bill. Crotophagi major*, LINN. and CUV.

This species is principally an inhabitant of the hotter regions of South America, and particularly of Brazil: it occurs however in various parts of North America, as well as in several of the West-Indian islands. There appear to be two races or varieties, agreeing in colour and general appearance, but differing in size; the larger being nearly of the size of a Magpie, and the smaller hardly exceeding that of a Blackbird.

In their mode of life these birds resemble the genus Buphaga, feeding principally on insects which infest cattle, and particularly on those of the genus Acarus, ranking under the division Ricinus or Tick, which in those regions are often dreadfully injurious to the cattle: they also feed on various kinds of lizards, worms, caterpillars, &c. and, in defect of these, will often attack various kinds of vegetables, and particularly maize and rice. They generally frequent open places, and are never observed in woods of any considerable size. They usually fly in small flocks of twenty or thirty together, and when on the ground or perched, are always observed to carry their heads drawn in, or close to the shoulders, sitting near each other, and uttering a constant chattering cry, somewhat in the manner of Starlings. They are of a bold and fearless nature, and are scarcely alarmed at the sound of fire-arms; and as they are not numbered among edible birds, on account of the rankness of their flesh, they may be said to enjoy a kind of privileged security. Their wings are short and their flight feeble, and, during a storm, numbers are said to be destroyed. They breed in March, and build in thick bushes, forming a very large nest of interlaced twigs and grasses, lined with dried leaves. It is pretended that several females lay, and hatch their eggs in the same nest; so that these birds may be considered as in some degree analogous to Beavers among quadrupeds. The nest is about a foot and a half in diameter, and of a very considerable depth; but varies according to the number of families that are to inhabit it. Some individuals, however, are said to build single nests, or else make divisions in the cavity of a large one for their own offspring: where this is not done, the whole of the eggs roll together in the middle of the nest, and one bird is said often to cover or sit on the whole; but it is to be supposed that, in this case, they relieve each other by turns: when the nest is at any time left without an attendant, care is taken to cover the eggs with a layer of leaves, both for concealment, and in order to preserve a proper degree of heat; and when the numerous family is hatched, the busy mothers are assisted by the males in feeding the young; and where several groups have been hatched in the separate inclosures of the larger nests, the parents are said to feed all in common, without making any particular distinction between their own offspring and that of their

neighbours. They are observed to breed several times in a year, and the eggs, which are several in number, are of a blueish-green colour.

The Keel-bill is a bird of a tame and gentle nature, and when taken early, may be educated in the same manner as a Parrot, and taught to speak; but its disagreeable smell is a reason for seldom practising this experiment.

Whether the larger and smaller races above mentioned ought to be considered as constituting one and the same species only, or whether they are truly distinct, can perhaps only be ascertained by an accurate examination of all particulars relative to these birds when observed in their native regions.

Fig. 6. *Wattle Bird, Glaucopis Cinerus*, Linn. and Cuv.

Inhabits New Holland, and feeds on insects, berries, &c.

PLATE CLXXXIII.—AMPHIBIA.

Genus Siren.

Fig. 1. *Eel-shaped Siren. Siren Lacertina*, Linn. and Cuv.

This species stands eminently distinguished in the list of animals by the ambiguity of its characters, which are such as to have induced the great Linnæus to institute it for a new order of Amphibia, under the title of *Meantes;* an order, however, which does not stand among the rest of the Amphibia in the Systema Naturæ, but is mentioned in a note at the end of the second part of the first volume of that work.

The genus with which the Siren has evidently the greatest possible affinity, is the Lacerta or Lizard. It even very much resembles the larva, or first state of a Lacerta; and it is still doubtful whether it may not really be such: yet it has never been observed in any other state, having two feet only, without any appearance of a hind pair: the feet are also furnished with claws, whereas the larvæ of all the Lacertæ are observed to be without claws; or, in the Linnæan phrase, *digitis muticis:* the mouth has several rows of smallish teeth: the body is eel-shaped, but slightly flattened beneath; marked on the sides by several wrinkles, and slightly compressed towards the extremity of the tail, which is edged with a kind of soft skin or adipose fin, as it were: on each side of the neck are three ramified branchial processes, resembling, on a larger scale, those belonging to the larvæ of water-newts, and at the base are the openings into the gills: the eyes are very small, and blue. The general colour of the animal is a deep or blackish brown, scattered over, especially on the sides, with numerous minute whitish specks. Its size nearly equals that of an Eel, being frequently found of the length of more than two feet. It is a native of North America, and more particularly of South Carolina, where it is not very uncommon in muddy and swampy places, living generally under water, but sometimes appearing on land. It has a kind of squeaking or singing voice, for which reason Linnæus distinguished it by the title of Siren.

The Siren, if thrown on the ground with any degree of violence, has been observed to break in two or three places; in this particular resembling the Anguis fragilis or Slow-Worm. It is also proper to observe, that no Lizard of which it may be supposed the Larva, has ever yet been discovered in those parts of Carolina where it is most frequent. The species to which it seems most allied is the Lacerta Teguixin of Linnæus, which is a native of South America.

Fig. 2. *Anguina Siren. Siren Anguina*, Linn. *Proteus Anguinus*, Cuv.

This singular animal is found in as singular a situation, being an inhabitant of the celebrated and romantic lake called Lake Zirknitz, about six German miles from Labac, in the Duchy of Carniola, in Austria.

With respect to its real nature, Zoologists are not yet agreed; some imagining it to be the Larva of some species of Lizard, whose gradations have not been fully ascertained, while others, with perhaps equal probability, suppose it a complete or perfect animal.

This animal appears evidently to be of a predacious nature; feeding on the smaller kind of aquatic animals; since one which was kept alive for some days in a vessel of water, was observed to discharge from its stomach several small shells of the genus Helix, and in the stomach of one which Dr. Schreibers dissected were found the head and bones of a small fish. Its voice is a strong hiss, louder than might be expected from the size of the animal.

PLATE CLXXXIV.—ICHTHYOLOGY.

The genus Cyclopterus of Linnæus is distinguished by an obtuse head, a short and thick tongue: the jaws are beset by a number of small acute teeth; the gill-membrane is four-rayed; body short and thick, without scales: the ventral fins are united into an oval concavity, forming an instrument of adhesion.

All the Cyclopteri are marine fishes, subsisting on worms, insects, and the fry of other species. By means of the oval concavity above mentioned, they can adhere to the rocks so firmly as to require great force for their removal.

Fig. 1. *Cyclopterus lumpus*, Linn. and Cuv. Common Lump-sucker.

The body has several rows of sharp bony tubercles, giving it an angular form. It inhabits the shores of Europe and of Greenland, and is in request by the people of the latter country as an article of food.

M. Cuvier has subdivided this genus into several others, among which that called Liparis is conspicuous. It has a single dorsal fin, which, like the anal, is rather long; the body is smooth, elongated and compressed behind.

Fig. 2. *Liparis ocellatus*, Cuv. *Cyclopterus ocellatus*, Linn.

This fish has a naked body tapering towards both ends, with two large ocellated spots immediately behind the eyes. Common on the coast of Great Britain.

Fig. 3. *Liparis lineatus*, Cuv. *Cyclopterus lineatus*, Linn.

A naked body with longitudinal blueish lines; the dorsal fins running gradually into the tail. It inhabits the seas of Northern Europe.

The genus Lophius of Linnæus has latterly been greatly subdivided, and we shall merely give the generic characters of two of these subdivisions, represented on the annexed plate.

Thus the genus Chironectes of Cuvier has four rays on the head, either terminating in a tuft, or uniting into a fin. The body and head are compressed; the mouth is cleft vertically; the dorsal fin occupies nearly the whole length of the back; the nutatory bladder is large, and the intestine has no cœca.

These fishes by filling their enormous stomachs with air, are able to expand their belly like a balloon. On land, their pairs of fins enable them to creep almost like quadrupeds, and thus they live out of water for two or three days. They are found in the tropical seas.

Fig. 4. *Chironectes marmoratus*, Cuv. *Lophius marmoratus*, Linn.

Body subcompressed and livid, varied with ferruginous spots, The nasal tendril is bifurcate. Inhabits the seas of Otaheite, and other places in the Pacific Ocean.

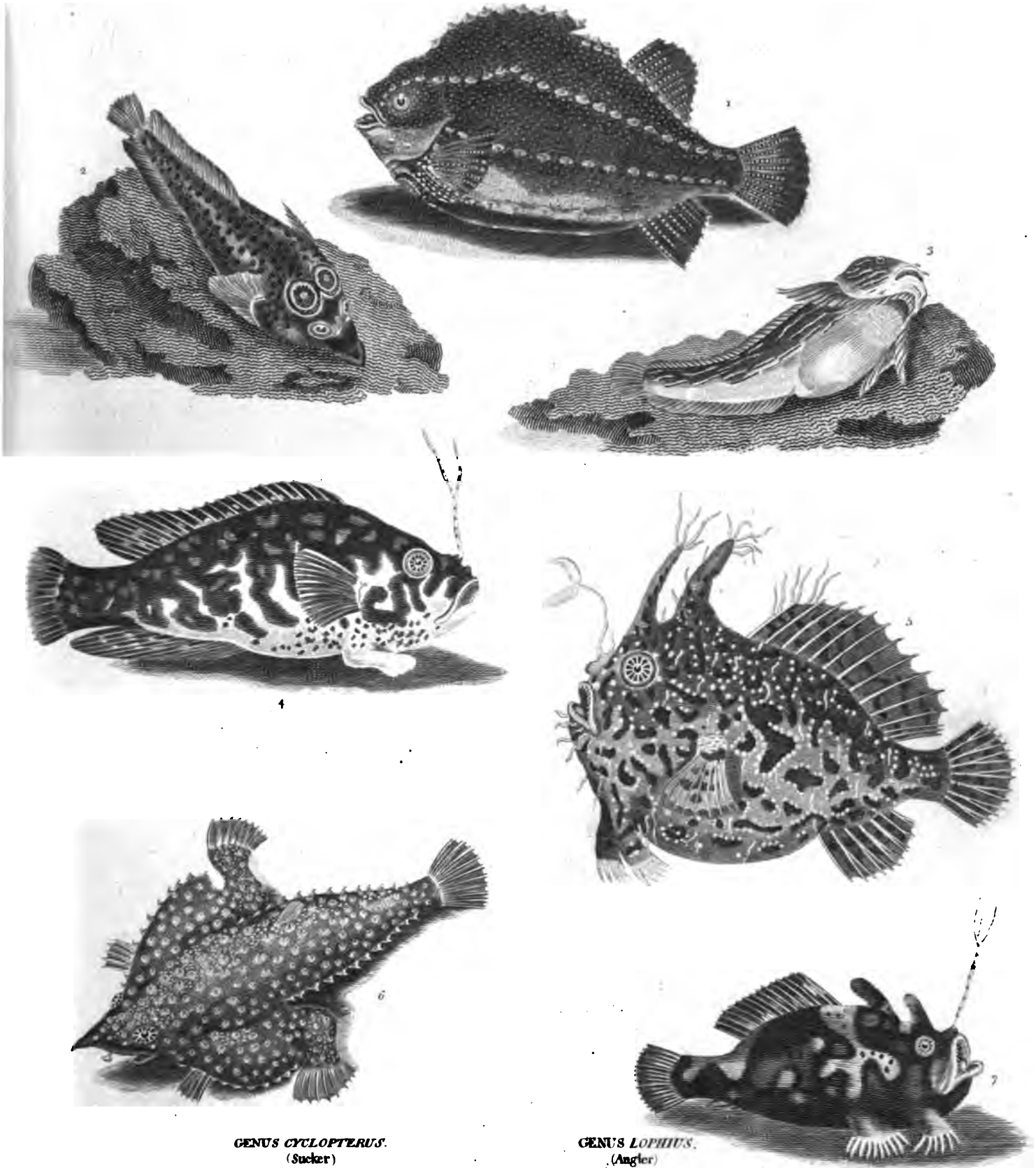
Fig. 5. *Chironectes histrio*, Cuv. *Lophius histrio*, Linn. Harlequin angler, or American Toad-fish.

GENUS. *SIREN.*



1 S. *Lacertina* EEL SHAPED

2 S. *Anguina* ANGUINA S.



GENUS *CYCLOPTERUS.*
(Sucker)

1.*C. Lumpus.* 2.*C. Ocellatus.* 3.*C. Lineatus.* 4.*L. Marmorata.* 5.*L. Histrio.* 6.*L. Rostratus.* 7.*L. Ptotus*
LUMP S. *OCELLATED S.* *LINEATED S.* *MARBLED A.* *HARLEQUIN A.* *BEAKED A.* *PAINTED A.*

GENUS *LOPHIUS.*
(Angler)

Order Coleoptera.

GENUS *DYTISCUS*



1 D. piceus
2 D. latissimus
3 D. marginatus
4 D. cinereus
5 D. caraboides

6 D. sulcatus
7 D. minutus
8 D. bipustulus
9 D. uliginosus
+ under Surface

ENTOMOLOGY.

Linn. Syst.

ORDER NEUROPTERA.

PLATE 18

GENUS Ascalphus. Hemerobius. Myrmeleon. Panorpa. Raphidia.



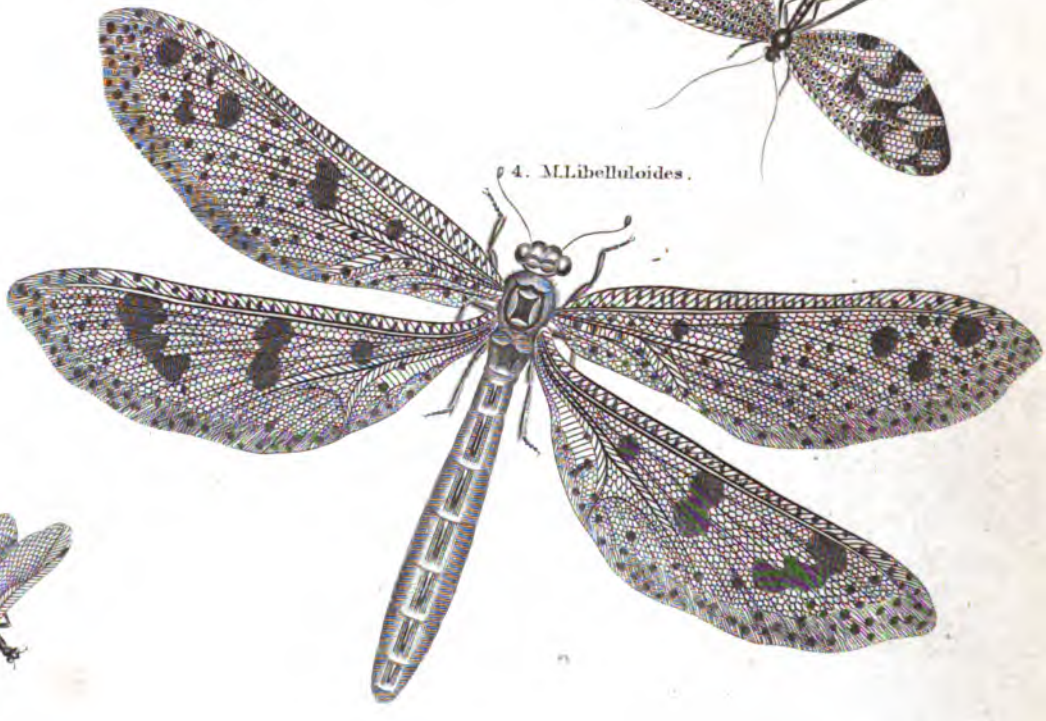
1. A.Americanus.



5. P.Communis.



7. P.Coa.



4. M.Libelluloides.



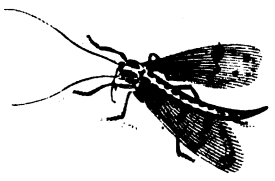
8. R.Ophiopsis.

9. R.Ophiopsis.

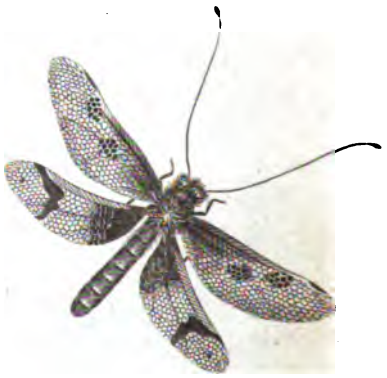




3. H.Chrysops.



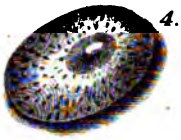
6. P.Communis.



2. A.Barbarus.

J.Williams

GENUS *PATELLA*.



4. P. virgata

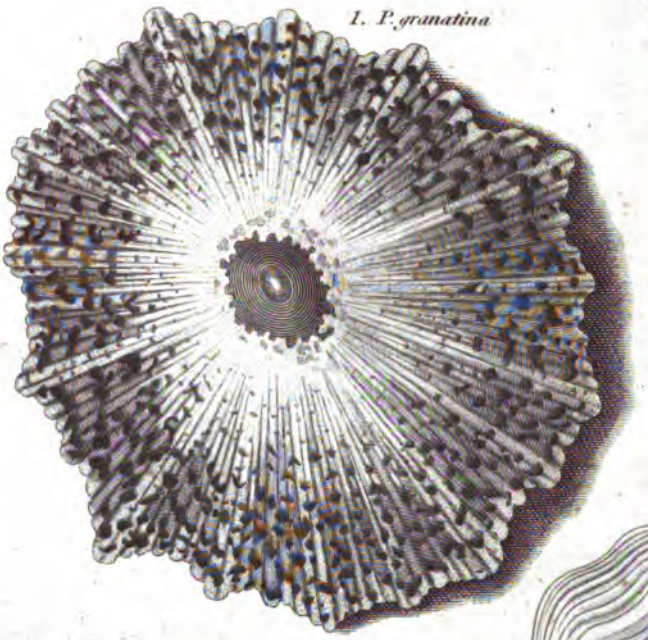
P. sagittata





7. P. auricula

1. P. granatina





3. P. vulgata var.

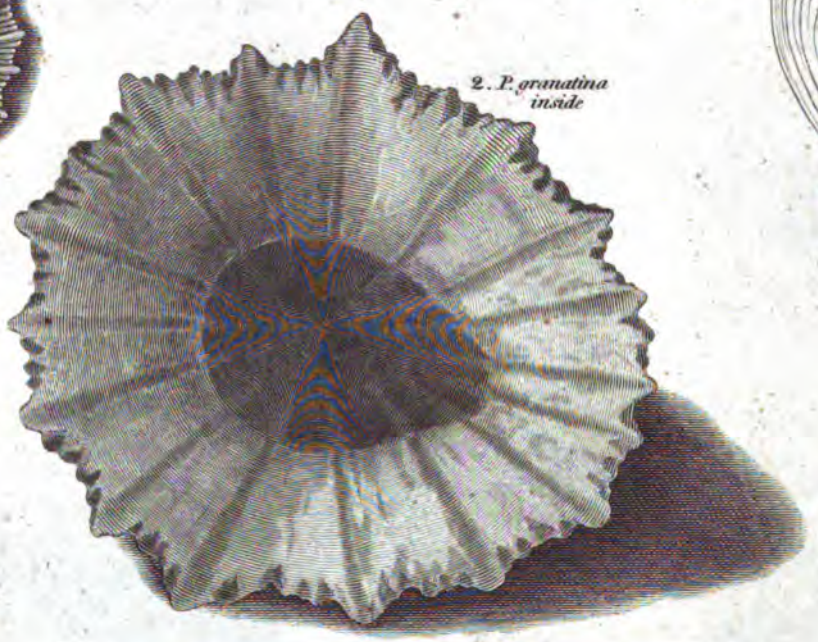
9. P. anatina





5. P. auricula

2. P. granatina inside



6. P. auricula



8. P. striata



It is of a compressed shape and yellowish brown colour, with irregular spots, and beards on the head and body. It is about a foot long, and its ventral fins resemble short arms. It is one of the most grotesque animals, of the fish tribe. Inhabits both the American and Indian seas.

Fig. 7. *Chironectes pictus*, Cuv. *Lophius pictus*, Linn.

Body compressed, brown, with yellowish blotches, edged with red: the nose-tendril is forked. Inhabits the Southern ocean.

In the genus Malthe of Cuvier, the head is extremely elongated and flattened; the snout is salient, and mouth beneath it, and protractile: a single small and soft dorsal fin; the body is studded with osseous tubercles. It has neither cœca or nutatory bladder.

Fig. 6. *Malthe rostratus*, Cuv. *Lophius rostratus*, Linn.

PLATE CLXXXV.—ENTOMOLOGY.

The Linnæan genus Dytiscus is of the order of Coleoptera, and is distinguished by having the antennæ setaceous; feelers six in number, and filiform; hind legs formed for swimming, fringed on the inner side, and nearly unarmed.

The species are inhabitants of stagnant waters, and, from the peculiar structure of their legs, are able to swim very well. They are seldom observed on the wing, except in the night time, when they fly abroad from one sheet or pool of water to another. The males have a horny concave flap or shield on the fore legs. The larvæ subsist on worms, aquatic insects, and the fry of fish, the latter of which they destroy in vast numbers.

Linnæus included in this genus several insects which are now placed in other genera, viz. Hydrophilus, Colymlutes, Hygrobia, Laccophilus, &c.; all of which are illustrated on the annexed plate.

Fig. 1. *Hydrophilus piceus*, Lat. *Dytiscus piceus*, Linn. Body black above; beneath, ferruginous.

Fig. 2. *Dytiscus latissimus*, Linn. and Lat. Black: margin of the wing-cases dilated, with a yellow line. Inhabits the north of Europe.

Fig. 3 & † 3. *Dytiscus marginalis*, Linn. and Lat. Olivaceous-black: margin round the thorax yellow. Inhabits Northern Europe.

Fig. 4. *Dytiscus cinereus*, Linn. Ashy: margin of the wing-cases, and half of the thorax yellow. Common in the waters of Europe.

Fig. 5. *Hydrophilus caraboides*, Lat. *Dytiscus caraboides*, Linn.

Fig. 6 & † 6. *Dytiscus sulcatus*, Linn. and Lat. Wing-cases brown, with ten longitudinal villous grooves. Inhabits Europe.

Fig. 7. *Dytiscus minutus*, Linn. *Laccophilus minutus*, Lat.

Fig. 8. *Colymbetes bipustulatus*, Lat. *Dytiscus bipustulatus*, Linn. Deep black: head with two red spots behind. Inhabits the north of Europe.

Fig. 9. *Hygrobia uliginosa*, Lat. *Dytiscus uliginosus*, Linn. Deep black, and glossy; other parts ferruginous. Inhabits the waters of Europe.

PLATE CLXXXVI.—ENTOMOLOGY.

The genus of insects called Ascalaphus belongs to the order Neuroptera: the antennæ are long, and terminate abruptly in a button: the abdomen forms an oblong oval, and is scarcely longer than the thorax.

Fig. 1. *Ascalaphus americanus*, Linn. and Lat.

Fig. 2. *Ascalaphus barbarus*, Linn. and Lat.

In Hemerobius, the body is soft, and the globular eyes are frequently ornamented with metallic colours: the wings are large, and their exterior border is widened. They fly slowly and heavily; and some of them diffuse a strong fecal odour.

Fig. 3. *Hemerobius chrysops*, Linn. and Lat.

The genus Myrmeleon has antennæ which enlarge insensibly, are almost filiform, hooked at the extremity, and much shorter than the body: the abdomen is long and linear.

Fig. 4. *Myrmeleon libelluloides*, Linn. and Lat.

In Panorpa the antennæ are setaceous, and inserted between the eyes: the clypeus is elongated into a conical lamina, arched above, to cover the mouth; and the mandibles, maxillæ, and labium are almost linear.

Fig. 5 & 6. *Panorpa communis*, Linn. and Lat.

Fig. 7. *Panorpa coa*, Linn. *Neuroptera coa*, Lat.

The genus Raphidia has the tarsi composed of four joints, and the wings are tectiform: the head is elongated and narrowed posteriorly; the thorax long, narrow, and nearly cylindrical.

Fig. 8 & 9. *Raphidia ophiosis*, Linn. and Lat.

Half an inch long, and black; the abdomen is marked with yellowish streaks; wings transparent, with a yellowish spot at the end.

Inhabits the woods of Europe. The larva conceals itself under the bark of trees.

PLATE CLXXXVII.—CONCHOLOGY.

The Patella, or *Limpet*, is a genus of shells which embraces a great number of species. The shell is formed of a single piece, in the form of a broad-based cone, sometimes smooth; in other instances, ribbed or tuberculated, and of extremely varied colours. The animal has a cordon of little branchial lamellæ under the margin of the mantle; the arms and genital orifices are above the head, which is furnished with a thick, short snout, and two pointed tentacula, on the external base of which are the eyes. The mouth is fleshy, and contains a spiry tongue. The stomach is membranous, and the intestine thin and tortuous. The heart is placed forwards, above and a little to the left of the neck.

They grow to very varied sizes, some species being minute, and others attaining a longitudinal diameter of eight inches. They always attach themselves to some hard body, and are not readily separated when warned of the approach of an enemy.

Fig. 1 & 2. *Patella granatina*, Linn. and Lam. Shell with a scalloped margin, and numerous muricated ribs running from the apex to the base. Inhabits the Atlantic Ocean, particularly the shores of Southern Europe and Northern Africa.

Fig. 3. *Patella vulgata, vel vulgaris*, Linn. and Lam. Shell with about fourteen angular ribs, and a crenate margin: apex central: colour olivaceous. Common to the shores of Europe.

Fig. 4. *Patella virgata*, Linn. and Lam. Shell ovate, with longitudinal striæ of a whitish colour: intermediate rays brown, spotted.

Fig. 5, 6, & 7. *Patella auriculata*, Linn. and Lam. With eleven or twelve strong ribs, and intermediate striæ: apex, subcentral.

Fig. 8. *Patella strigata*, Linn. and Lam. Oval, with irregular, radiated markings: apex subcentral.

Fig. 9. *Parmophorus anatina*, Lam. *Patella anatina*, Linn. Inhabits the seas of New Holland.

PLATE CLXXXVIII.—ZOOPHYTES.

GORGONIA is a genus of Zoophytes, the stem of which is coriaceous, woody, horny, or even bony, and in general flexible; the texture is glassy, or fibrous, or stony, fixed at the base, and covered with a vascular or cellular bark, which is friable and spongy in the dried state: the surface is covered with cells.

These bodies were regarded by the ancients as a class of plants, (as heretofore mentioned in this work,) but are now known to be the fabrication and domicile of minute but genuine animals.

Among the various observers of these curious beings, Prof. Pallas stands pre-eminent; to whose name we may add those of Mr. Ellis, Dr. Solander, and M. Lamarck. The latest observations confirm the opinion above stated, of the animal nature of these productions; viz. that each cell of the Gorgonia is the habitation of a distinct polipiferous animal; that they lie dormant in cold weather; and, like the blossoms of plants, put forth buds, and expand in their proper season, which is during the warmth of summer. The stem and branches may be considered as the true skeleton of these nests of habitations, being covered with a flesh-like, porous membrane.

It may also be observed, that the Gorgonia differ exceedingly in size, viz. from a few inches to ten or twelve feet, of a ramose and foliated structure, forming a conspicuous portion of those vast submarine "groves of coral" which navigators have observed in the tropical seas.

The annexed plate illustrates three beautiful species of this singular zoophyte.

FIG. 1. *Gorgonia reticulata*, LINN. and CUV. Reticulated Sea-fan. Net-formed, branches with very close-set rounded ramifications, and red tuberculated bark. It is very ponderous. Inhabits the Indian Ocean.

FIG. 2. Fragment of the same species, magnified.

FIG. 3. *Gorgonia umbraculum*, LINN. and CUV. Somewhat retiform; branches numerous, divergent, and round; colour reddish, warted, or covered with florets. Inhabits the Indian Ocean.

FIG. 4. Same species, magnified.

FIG. 5. *Gorgonia nobilis*, LINN. *Isis nobilis*, CUV. The true red coral of the jewellers.

The bone of this species constitutes the true red coral. It inhabits the Red Sea, the Mediterranean, and the Adriatic, where the coral fishery is a very lucrative one. It grows in a shrubby form, sometimes inverted, to the height of twelve or eighteen inches, the circumference of the largest branches not exceeding one inch. Externally, the surface is striated, more or less nodulous or warted; and the substance, when fractured, is concentrically lamellated. Its beauty and hardness have rendered it valuable, from the earliest ages; and to this day, it bears a considerable price throughout the world.

The polypes which occupy the cells of this coral, are each furnished with eight retractile arms or tentaculæ, in the centre of which is the mouth; the cells are filled with a fluid, and the polypes are of the same colour.

PLATE CLXXXIX.—GEOLOGY.

FIG. 1. Represents what is called the inclined stratification, the rocks being beds of slate, *a*, *c*, &c., lime-stone, *d*, *e*, and sand-stone, *b*. The angle made with the horizontal line, is called the *dip*. The layers in each of these beds, *a*, *b*, *c*, &c. being parallel to those in all the rest, their stratification is called conformable: *c* is said to *crop out*, where it emerges from beneath, *b*, and shows itself on the surface. An escarpment signifies the kind of hill or slope formed by the termination of the beds of any stratum, as at *e*.

FIG. 2. A dislocation of the strata, producing a change in the dip. The irregular line where the beds change their direction, is often called a *fault*.

FIG. 3. The basin-shaped, or undulating stratification, usual in coal-seams. The black lines represent the coal seams, divided by thicker seams of slate. The upper ones are supposed, in such a case, to have been prolonged in undulations parallel to the lower, but to have been subsequently washed away by the force of tremendous currents rushing across the land.

FIG. 4. A case of waving stratification, supposed to arise from the action of some internal force exerted upwards.

FIG. 5. Represents a series of rocky strata, first thrown into the inclined position by some convulsion, and afterwards scooped out by the excavating power of currents passing over the surface. The same stratum, *a*, *a*, is seen appearing on both sides of the valley *B*; having the same position and dip, all the beds are supposed to have been once connected, as the bed at *B* is. The laying naked of the lower beds is called denudation; and such a valley is always termed a *valley of denudation*. An insulated hill produced by the cutting off on all sides of the strata in it, is called an *outlier*. Seen on the left hand.

FIG. 6. A transverse section of the rocks in many mountain ranges, as the Alps. *G*, granite, the axis of the mountain; *d*, sand-stone, resting conformably on the inclined surface of the granite; *c* and *b*, slates and limestones parallel to *d*.

FIG. 7. A case of *unconformable* stratification, the nearly horizontal strata, *b*, *b*, *b*, filling the inequalities of the more ancient formation *a*. This latter is supposed to have been deposited at first horizontally, then upheaved, then *denuded*; the depressions finally filled by the later deposits, *b*, *b*, *b*, covering the *oblique* edges of the beds in *a*. The hill *b* exhibits an elevated portion of the older formation, which the more recent formations did not cover up.

FIG. 8. A dislocation of strata attended by a change of dip and a *down-heave* on one side; the beds *c* and *c*, *d* and *d*, &c. are conceived to have been once continuous, and subsequently rent asunder. The intervening fissure is often filled by a wall of hard rock, which is called a *dyke*, sometimes a vein. The displacement called a *fault*, is frequently made by a fissure of scarcely perceivable thickness, filled with clay, or open.

FIG. 9. A case of dislocation of the strata, exhibiting several contrary dips, and a fault.

FIG. 10. Exhibits a ground plan, or bird's-eye view of a vein, *a*, *a*, once continuous, but ruptured and *heaved* by the slide or fault, *b*, *b*. The former cases of displacement of the strata have been vertical; this is horizontal: the first are *faults*; this is termed a *heave*. Approaching the fissure, *b*, *b*, from either side, the continuation of the vein *a* occurs on the *left* hand, and this is called, therefore, a *heave* to the left.

PLATE CXC.—QUADRUPEDS.

MAMMALIA, Order FERAE. Genus CANIS.

FIG. 1. *The Stag-hound. Canis Strenuus.*

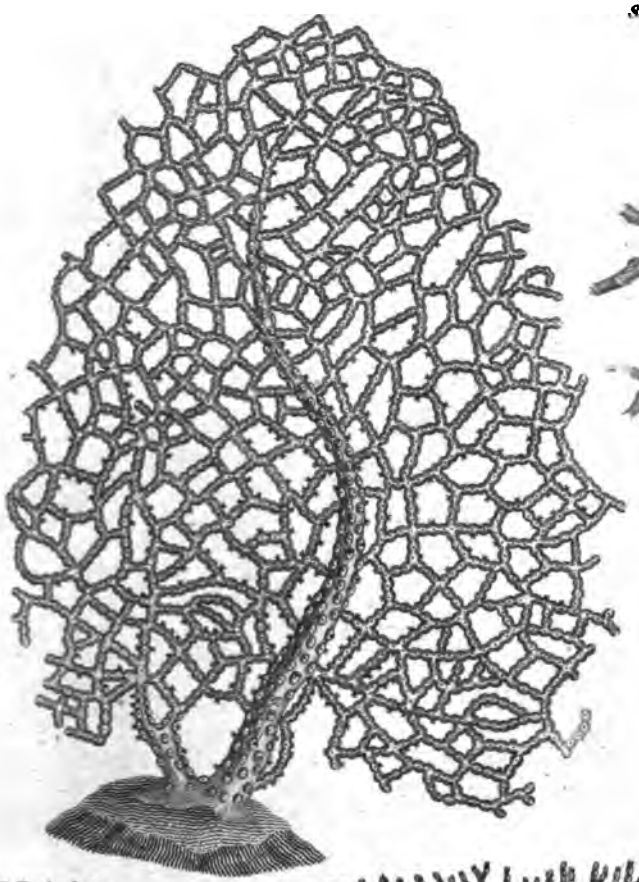
The Stag-hound is now the largest and most powerful of all the dogs which go under the general term of hound. He is held higher in estimation than any other dog of the chase, and has a most commanding and dignified aspect, blended with every mark of intellectual mildness.

It has been asserted by the most celebrated naturalists, that the hound, harrier, turnspit, water-dog, and spaniel, are originally of the same race; and there seem to be strong reasons for believing this to be the case, as their figures and instinctive

ZOOPHYTES.

GENUS *GORGONIA*.

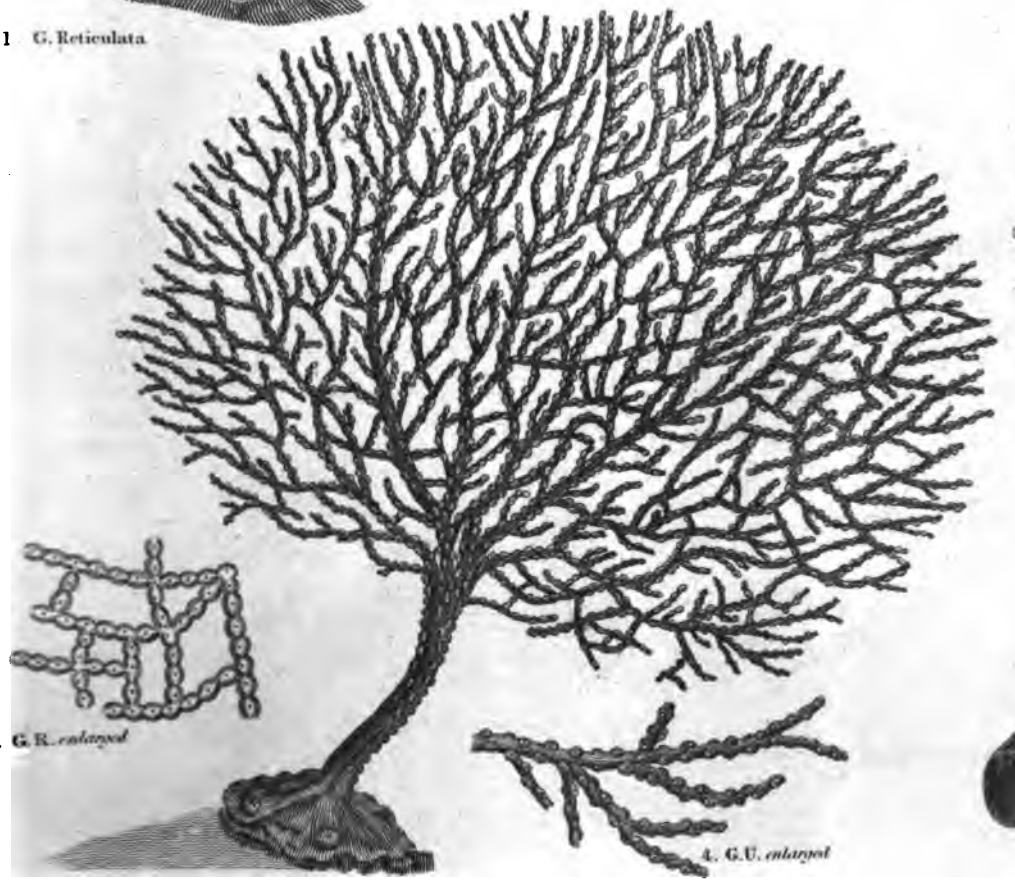
Sea Fan.



1 G. Reticulata



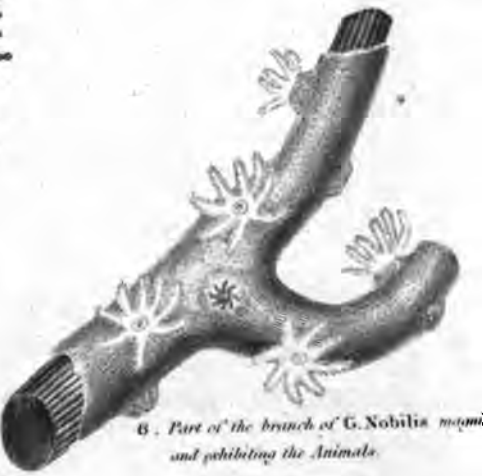
5 G. Nobilis



2. G.R. *enlarged*

4. G.U. *enlarged*

3. G. Umbraculum



6. *Part of the branch of* G. Nobilis *magnified and exhibiting the Animals.*

Fig. 1.

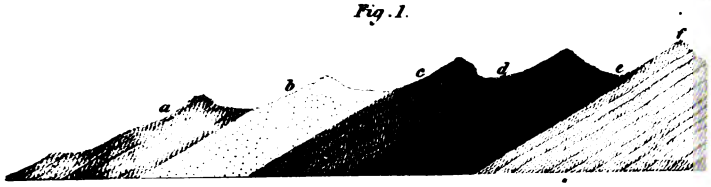


Fig. 2.

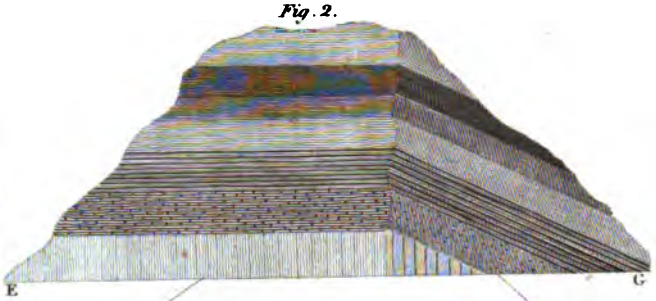


Fig. 3.

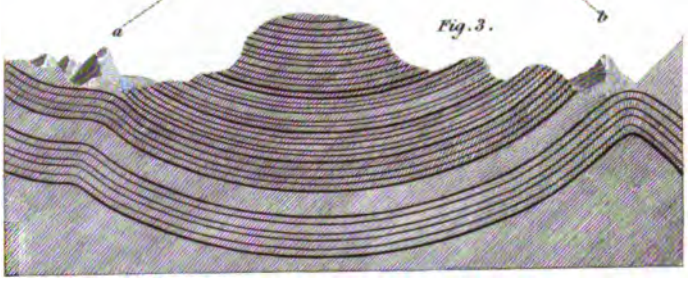


Fig. 4.

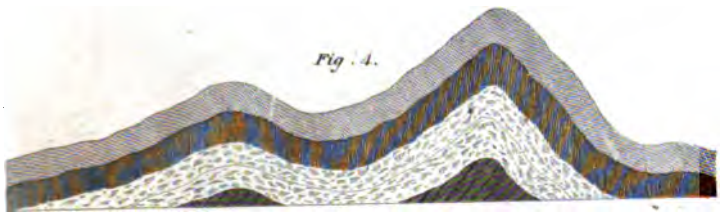


Fig. 5.

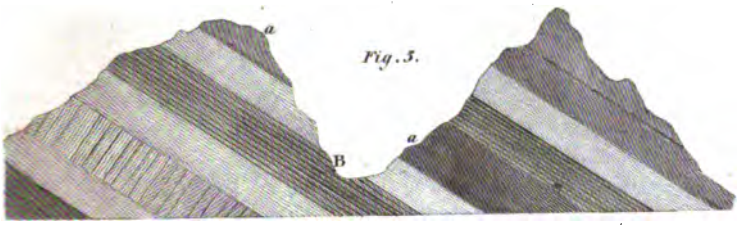


Fig. 4.

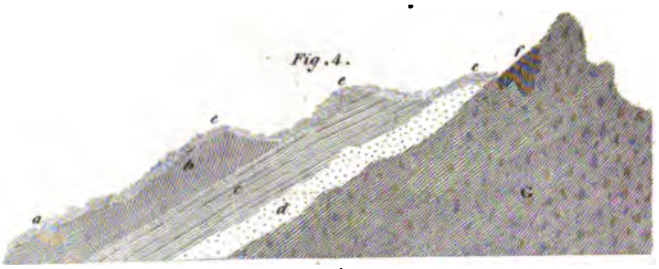


Fig. 7.

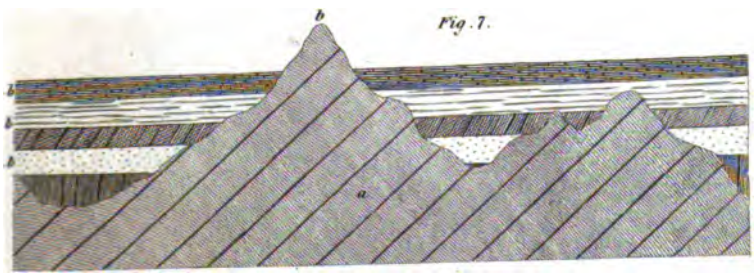
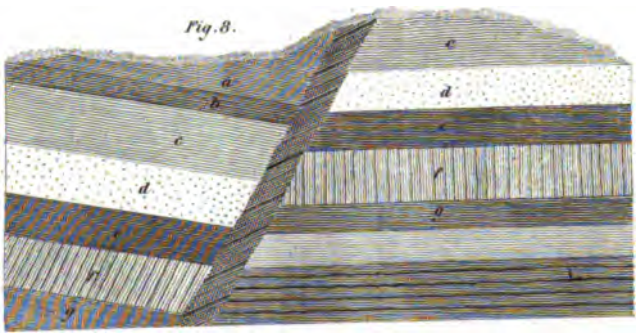
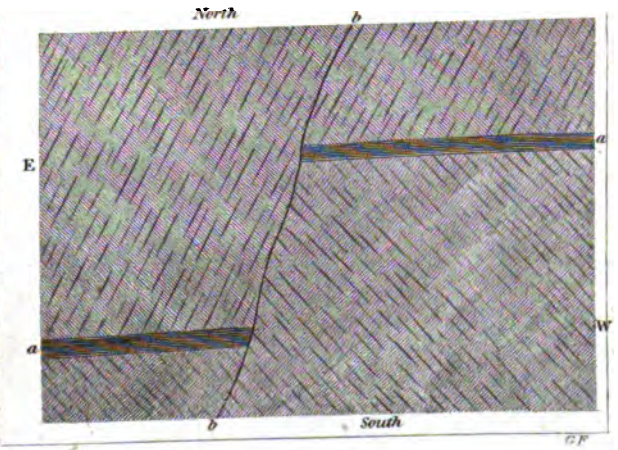


Fig. 8.

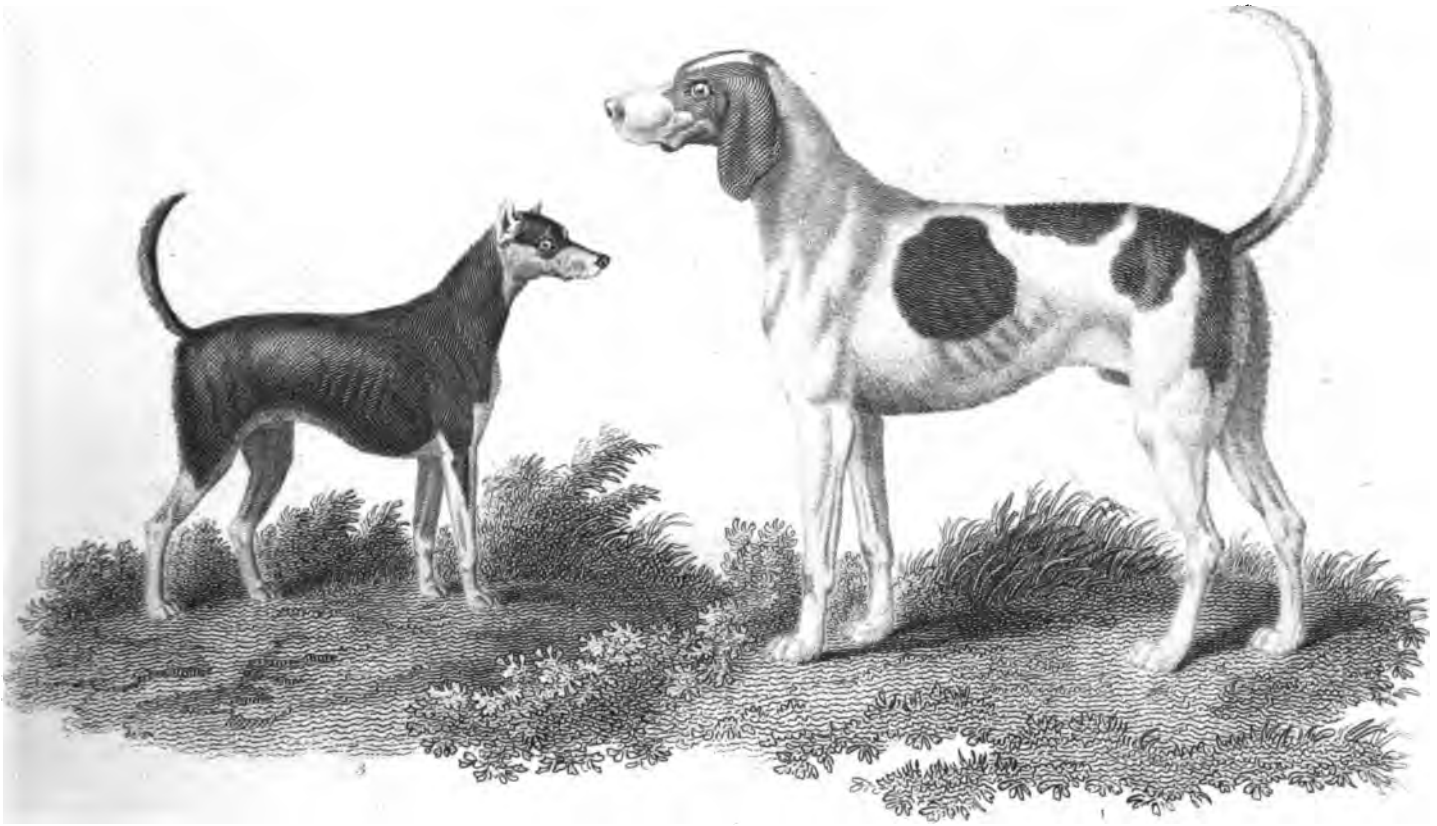


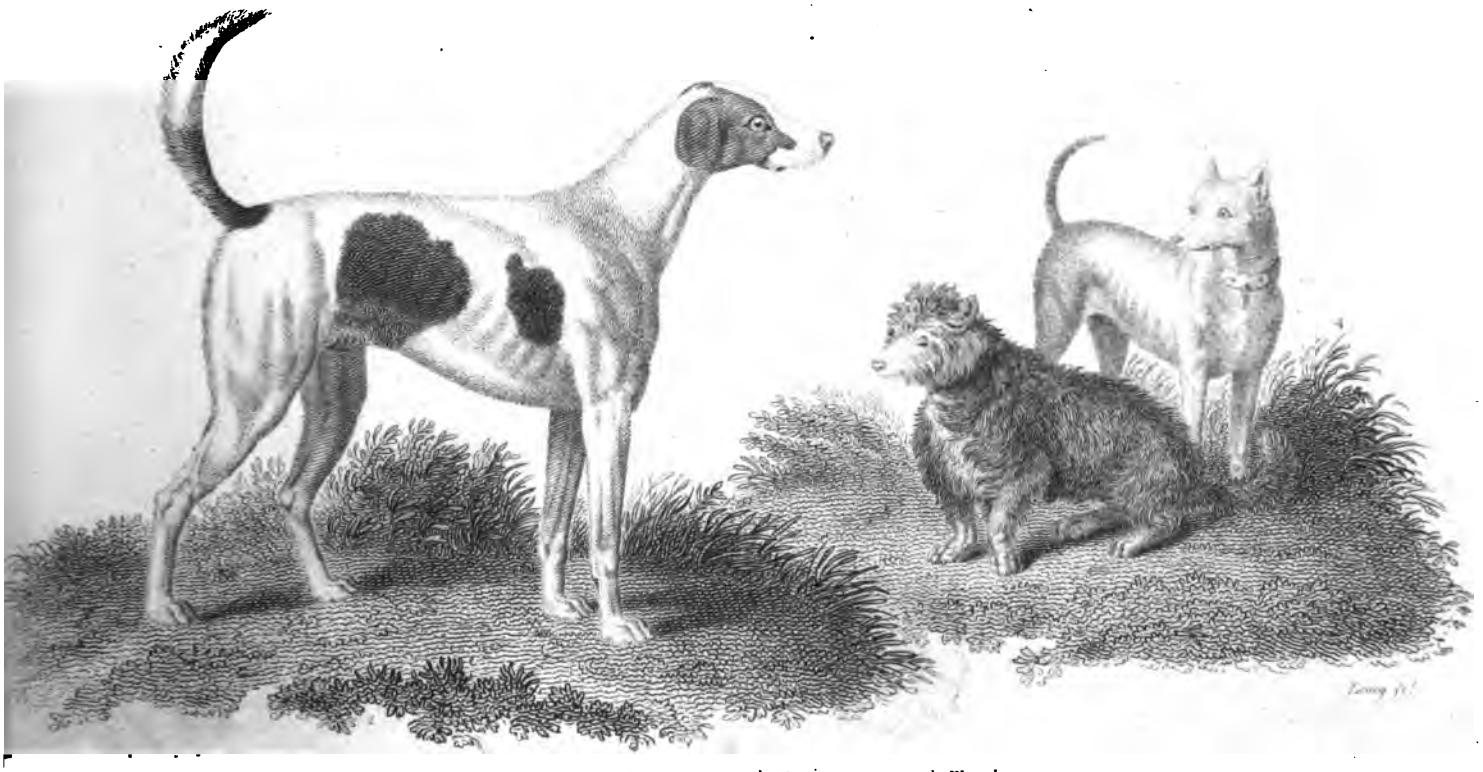




QUADRUPEDS.

CLASS I.st MAMMALIA - *ORDER III.D* FERÆ - *GENUS XV* CANIS.





1. Stag Hound. 2. Fox Hound. 3 & 4. Smooth Terriers. 5. Rough Terrier.

properties are nearly allied in all of these kinds; the principal difference consisting in the length of their legs and the size of their ears, which are in all of them soft in their texture and pendulous. The hound and harrier are supposed to be natives of Britain, France, and Germany, an opinion which is attended with some degree of reason, for when transported to warmer climates they quickly degenerate.

It seems extremely probable that this large, strong, and bony hound was the primeval stock from which all the collateral branches of this race have descended; and that all deviations from the original stem have been the result of crosses and improvements, during many centuries, by those skilled in rearing and breeding dogs of the chase, and varied in size and strength, according to the particular sport for which they were intended. At the present day there cannot be a doubt but that the practical breeder, by judicious crosses, can either enlarge or diminish the stature and strength of his pack in the course of three or four generations.

The stamp of royalty has given to the hunting of the stag a kind of eclat. Its chief claim to excellence may be in a great measure attributed to the splendour of the scene, and the vast assemblage of people which attend in fine weather; for it has been allowed by most people who, from indulging in both sports, have had an opportunity of judging, that stag-hunting is by no means to be compared to the pleasures of a fox-chase, with a well-trained pack of hounds.

Differently from fox and hare hunting, it is always the practice, if possible, to take the stag alive; every one present exerting all his energies for the preservation of that animal, which, being deprived of the natural advantages of an open country, has not a fair chance of saving his life.

Extraordinary Perseverance.—The following anecdote affords a proof of the wonderful spirit of the Stag-hound in supporting a continuance of exertion. Many years since, a very large stag was turned out of Whinfield Park, in the county of Westmoreland, England, and was pursued by the hounds till, by fatigue or accident, the whole pack was thrown out, except two staunch and favourite dogs, which continued the chase the greatest part of the day. The stag returned to the park from whence he set out, and, as his last effort, leapt the wall, and immediately expired. One of the hounds pursued him to the wall, but being unable to get over, lay down and almost instantly died; the other was found dead at a little distance.

The length of the chase is uncertain; but, as they were seen at Red Kirk, near Annan, in Scotland, (distant by the post-road about forty-six miles,) it is conjectured that the circuitous and uneven course they might be supposed to take would not be less than *one hundred and twenty miles.* To commemorate this fact, the horns of the stag, which were the largest ever seen in that part of the country, were placed on a tree of enormous size in the park, (afterwards called Hartshorn Tree,) accompanied with this inscription:—

"Hercules kill'd Hart o' Greece;
And Hart o' Greece kill'd Hercules!"

The horns have since been removed.

Fig. 2. *Fox-hound. Canis Celer.*

The muzzle of the Fox-hound is rather long, and his head small in proportion to his body; his ears long and pendulous, though not so much so as those of the Blood-hound or the Stag-hound. His legs are very straight, his feet round and not too large, his chest deep, and breast wide, his back broad, his neck thin, his shoulders lie well back, his tail thick and bushy, and carried high when in the chase. His colour is generally white, variously patched with black in different parts of the body.

Mr. Daniel makes the following remarks on the choice of hounds. Most sportsmen have their prejudices as to the colour of their dogs. In an old distich, it is said,—

"So many men, so many minds,
So many hounds, so many kinds;"

and the choice of hounds in former times, as to colour and other points, is no bad commentary upon it; for we are gravely told, that white-coloured dogs, especially those that were pupped without any spot upon them, although not generally good for all sorts of game, were excellent for the stag; that people from experience valued them, because of their natural instinct, being curious hunters, with admirable noses, and very good at *stratagems;* and, moreover, that they were less subject to diseases, by reason of a predominancy of phlegm, which gave them a good temperament of body.

Black hounds were not to be rejected, especially when marked with white and not red spots, the whiteness proceeding from the phlegmatic constitution, which was supposed to insure memory. They were at the same time more obedient, and were said to be good hunters, not frightened at water, and so hardy as seldom to require the doctor.

No country in Europe can boast of Fox-hounds equal in swiftness, strength, and agility, to those of Britain, where the utmost attention is paid to their breeding, education, and food. The climate also seems congenial to their nature.

The chief excellence in a pack of Fox-hounds is the head they carry, taken collectively; and on this and the fineness of their noses depends their speed. Mr. Beckford says, "that hounds should go, like the horses of the sun, all abreast." Five-and-twenty couple are a sufficient force at any time to be taken into the field; they are a match for any fox, supposing them steady, and their speed nearly equal: too heavy dogs always do more mischief than service. Hounds that are meant to run well together should never have too many old ones amongst them. Five or six seasons are sufficient to destroy the speed of most dogs, although this depends much on constitution. We are informed of a spayed bitch, called Lilly, which ran, at the head of Mr. Paxton's harriers, at Newmarket, for five seasons,—a singular instance of undiminished speed.

Disastrous Perseverance.—The circumstance which happened to the late Duke of Northumberland's pack, proves the Fox-hound's eagerness after his game. In 1796, the hounds ran a fox into a very large furze cover near Alnwick, called Bunker's Hill, where he was lost in an earth which no one knew of. Upon the dogs coming to the kennel, two couple and a half of the best of them were missing, and not returning that night, it was thought they had found a fox, and had gone off by themselves in pursuit of him. Several men were sent in search of them to all the earths and crags for twenty miles round, but no tidings could be gained of them. The course where the fox was lost was then searched, and the earth discovered, and in digging about two yards deep, one dog was found; several yards farther, three more, fast in the ground; and two yards deeper, the fifth was dug up. They were all dead.

Fig. 3 & 4. *Smooth Terrier. Canis Terrarius.*

It is now impossible to trace the origin of the Terrier, but, from the many characteristics peculiar to itself, we would almost be induced to consider it a primitive race. Certain it is, that this dog has been for many ages assiduously cultivated, and trained to the particular sports to which nature seems to have so well adapted him. To the fox, hare, rabbit, badger, polecat, weasel, rat, mouse, and all other kinds of vermin, he is a most implacable enemy. He has also a strong natural antipathy to the domestic cat.

The name Terrier seems to be derived from the avidity with which he takes the earth in pursuit of all those animals which burrow.

There are two kinds of Terriers, the rough-haired Scotch and the smooth English.

The Scotch Terrier is certainly the purest in point of breed, and the English seems to have been produced by a cross from him.

The Scotch Terrier is generally low in stature, seldom more than twelve or fourteen inches in height, with a strong muscular

body, and short and stout legs; his ears are small and half-pricked; his head is rather large in proportion to the size of his body, and the muzzle considerably pointed; his scent is extremely acute, so that he can trace the footsteps of all other animals with certainty: he is generally of a sand-colour or black. Dogs of these colours are certainly the most hardy, and more to be depended upon. When white or pied, it is a sure mark of the impurity of the breed. The hair of the Terrier is long, matted, and hard, over almost every part of his body. His bite is extremely keen.

There are three distinct varieties of the Scotch Terrier, viz. the one above described, another about the same size as the former, but with the hair much longer, and somewhat flowing; which gives his legs the appearance of being very short. This is the prevailing breed of the Western Islands of Scotland. The third variety is much larger than the other two, being generally from fifteen to eighteen inches in height, with the hair very hard and wiry, and much shorter than that of the others. It is from this breed that the best Bull-Terriers have been produced.

The Terrier, amongst the higher order of sportsmen, is preserved in its greatest purity, and with the most assiduous attention; and it seems of the utmost importance not to increase its size, which would render him unsuitable for the purposes in which he is employed, that of entering the earth to drive out other animals from their burrows, for which his make, strength, and invincible ardour, peculiarly fit him. On this account, he is the universal attendant upon a pack of fox-hounds, and though *last* in the pursuit, he is not the *least* in value. Indeed a brace of these dogs is considered indispensable in a complete fox-hunting establishment, and they are generally of different sizes, so that the smallest may enter an earth which is too large for the other. As soon as the hounds are thrown into covert, the Terrier becomes the busiest in the field when endeavouring to find the fox; whenever the game is started, and the hounds running breast-high, and at their utmost speed, this active little animal is seldom far behind, and is sure to be up at the first check. It is when the fox is supposed to have earthed, that the services of the Terrier are more essentially required; he enters with the utmost eagerness, and soon informs the ear of the sportsman whether or not he is in, and at what distance from the mouth, when he is speedily dug out.

The principal objection to the reddish-coloured Terriers in a pack is, that by juvenile sportsmen, in the clamour of a chase, they are frequently hallooed off for a fox.

FIG. 5. *Rough Terrier. Canis Terrarius. Variety.*

This is a handsome sprightly dog, and generally black on the back, sides, upper part of the head, neck, and tail; the belly and the throat are of a very bright reddish-brown, with a spot of the same colour over each eye. The hair is short and somewhat glossy; the tail rather truncated, and carried slightly upwards; the ears are small, somewhat erect, and reflected at the tips; the head is little in proportion to the size of the body, and the snout is moderately elongated. This dog, though but small, is very resolute, and is a determined enemy to all kinds of game and vermin, in the pursuit and destruction of which he evinces an extraordinary and untaught alacrity. Some of the larger English Terriers will even draw a badger from his hole. He varies considerably in size and strength, and is to be met with from ten to eighteen inches in height.

This dog, or the wire-haired Scotch Terrier, is indispensably necessary to a pack of fox-hounds, for the purpose of unearthing the game. From the greater length of leg, from his general lightness, and the elegant construction of his body, he is more adapted for running, and, of course, better enabled to keep up with the pack than the Scotch Terrier.

Mr. Daniel, in his Rural Sports, mentions a match against time with a Terrier, which took place in 1794, in which a small dog ran six miles; the first mile in two minutes, the second in four, the third in six, the fourth in eight, and the fifth and sixth in eighteen minutes,—an immense falling off, considering his wonderful speed and the known stoutness of the Terrier. Perhaps there was some unsteadiness either in the watch or watch-holder. He afterwards ran six miles in thirty-two minutes.

PLATE CXCI.—QUADRUPEDS.

Class MAMMALIA. Order FERAE. Genus MUSTELA.

FIG. 1. *Sea-Otter. Mustela lutris*, LINN. and CUV.

This is the largest of the Otters, measuring about three feet from the nose to the tail, and the tail thirteen inches. The colour of this species is a deep, glossy, brownish-black; the fur being extremely soft and very fine; on the forehead is generally a cast of grayish or silver-colour: the ears are erect, sharpish, and small: the whiskers long and white: the fore legs thick and furnished with four toes, covered with hair, and webbed: the hind feet resemble those of a Seal; the toes being connected by a strong granulated membrane, with a skin skirting the outward toe, as in some of the water-fowl: the tail is short, broad, depressed, and pointed at the end. The Sea-Otter has been found of the weight of seventy or eighty pounds. It is sometimes seen of a silvery or hoary tinge. According to Mr. Pennant, it is one of the most local animals we are acquainted with, being entirely confined between lat. 44. and 60. north; and between east long. from London, 126. to 150.; inhabiting, in great abundance, Bhering's Islands, Kamtschatka, the Aleutian and Fox Islands, between Asia and America. They land also in the Kuril Islands, but are never seen in the channel between the north-east of Siberia and America. It is supposed that they bring forth but one at a time. They are most extremely harmless animals, and are singularly affectionate to their young. They bring forth on land, and often carry the young one between their teeth; fondle them, and frequently fling them up and catch them again in their paws; and before they can swim, the parents take them in their fore feet, and swim about on their backs. The young continues with its parent till it takes a mate.

This animal is killed for its skin, which is one of the most valuable of furs, being sold at the rate of from 14 to 25 pounds sterling each. They are said to be chiefly sold to the Chinese.

The Sea-Otter is sometimes taken with nets, but is more frequently destroyed with clubs and spears.

In the Philosophical Transactions for the year 1796, we meet with a description of the Sea-Otter by Mr. A. Menzies, accompanied by some observations by Mr. Home. From the description there given it appears that the hind feet were completely covered with hair both above and below, except a small bare spot beneath each toe, so that in this particular the animal either varies, or the hair at some particular seasons may fall away from the webs of the feet, so as to leave the skin bare, as mentioned in Mr. Pennant's description: the hind feet in the specimen now mentioned measured eight inches across: the tongue was four inches long, and rounded at the end, with a slight fissure, giving the tip a bifid appearance. In this respect, as well as in the structure of the hind feet, the Sea-Otter makes an evident approach to the Seal.

FIG. 3. *Common Otter. Mustela lutra*, LINN. and CUV.

The common Otter is found in almost every part of Europe, as well as in the colder regions of Asia; inhabiting the banks of rivers, and feeding principally on fish. It occurs also in the northern parts of America, and particularly in Canada, where it appears to arrive at a larger size than in Europe. In the river Euphrates, on the contrary, it is said to be found no larger than a common cat; but it is probable, that this is in reality a different species, viz. the L. Lutreola, or smaller Otter. The usual length of the Otter is near two feet from nose to tail, and of the tail about sixteen inches. Its colour is a deep brown,

QUADRUPEDS.

CLASS MAMMALIA. ORDER FERÆ. GENUS MUSTELA.

PLATE. 191.



1. M. Lutris. Sea Otter. 2. M. Lutra. Otter. 3. M. Foina Martin. 4. M. *Zibellina*. Sable.



1.C. *Chalcoptera* BRONZE WINGED P.

2.C. *Erythroptera* GARNET WINGED P.

3.C. *Macroura* GREAT TAILED P.

4.C. *Nicobarica* NICOBAR P.

5.C. *Curvirostra* HOOK BILLED P.

6.C. *Capensis* CAPE TURTLE

7.C. *Coronata* GREAT CROWNED P.

with a small light-coloured patch on each side of the nose, and another under the chin: the throat and breast are ash-coloured: the head is flat and broad: the mouth small; the teeth strong; the lips very thick and muscular; the ears short and rounded; and the eyes small, and situated near the nose: the neck is very thick; the legs short and thick, loosely joined to the body, and so placed as to be capable of being brought on a line with the body, and of performing the office of fins; the toes, which are five in number on all the feet, are connected by broad and strong webs, and the whole foot is naked or without hair. "The Otter (says Mr. Pennant) shows great sagacity in forming its habitation: it burrows under ground in the banks of some river or lake; and always makes the entrance of its hole under water; working upwards to the surface of the earth, and, before it reaches the top, makes several *holts* or lodges, that in case of high floods it may have a retreat; for no animal affects lying drier; and then makes a minute orifice for the admission of air: it is farther observed, that this animal, the more effectually to conceal its retreat, contrives to make even this little air-hole in the midst of some thick bush." Though the principal food of the Otter consists of fish, yet it is said that in hard weather, when this its natural prey fails, it will attack the smaller quadrupeds, as well as poultry, &c. The Otter is naturally a very fierce animal, and when hunted with dogs, as is sometimes the practice, will inflict very severe wounds on its antagonists. The female produces four or five young at a birth: this commonly happens early in the spring. The young Otters, if taken at a very early age, may be successfully tamed, and taught by degrees to hunt for fish, and bring them to their master. This taming of Otters, and employing them in fishing, is mentioned by Aldrovandus (from Albertus Magnus) as a circumstance familiarly known, and more especially, according to Albertus, in Sweden, where he tells us that, in the houses of the great, these animals were kept for that purpose, and would go out, at a signal from the cook, catch fish, and bring it into the kitchen in order to be dressed for dinner!

FIG. 3. *Martin. Mustela Foina*, LINN. and CUV.

The Martin is an animal of a highly elegant appearance. Its general length, from nose to tail, is about a foot and a half, and the tail is ten inches long. The Martin is of a blackish tawny colour, with a white throat; and the belly is of a dusky-brown; the tail is bushy or full of hair, and of a darker colour than the other parts: the ears are moderately large and rounded, and the eyes lively. This animal is a native of most parts of Europe; inhabiting woods and fields, and preying on birds and other small animals. If taken young, it may be easily tamed, and even rendered domestic. It breeds in the hollows of trees, and brings forth from three to five young. The skin is used as a fur.

FIG. 4. *Sable. Mustela zibellina*, LINN. and CUV.

The sable is about eighteen inches in length. It resembles the martin in its form, being fully longer than the polecat, in proportion to its thickness.

It is a native of Siberia, Kamtschatka, and some of the islands which lie between that country and Japan, and also of Lapland, living in holes, by the banks of rivers, and under the roots of trees. Its nest consists of moss, small twigs, and grass.

This animal does not appear to be so predaceous as its congeners; for its chief food, in winter, consists of berries of different kinds. In summer, however, before these ripen, its necessities force it to prey upon hares, weasels, ermines, and other small animals.

The sable is extremely vivacious, and leaps with great nimbleness from tree to tree, after small birds and squirrels.

The female brings forth in the spring, and produces from three to four at a birth.

M. Gmelin mentions two of these, which he had in some measure domesticated. He says that, whenever they perceived a cat, they would raise themselves on their hind feet, and, with their fore paws, prepare to defend themselves. During the day, more particularly after eating, they always slept, and frequently so soundly, after a meal, that they required to be pricked, pinched, and shaken, before they would awaken; but at night, they were extremely active and lively.

The sable fur is dark brown, whitish on the head, and gray on the throat. A great quality in it, is, that the hair turns, with equal ease, to either side. The darker the colour, it is the more valuable; and few skins are in higher estimation than that of this animal. One of these, although only about four inches in breadth, has been sometimes valued as high as fifteen pounds. The general price, however, is from one pound to ten, according to the quality. The bellies of sables, about two fingers in breadth, are sold separately from the upper parts, and generally in pairs, which are tied together in bundles of forty pieces, and bring from one to two pounds each bundle. The tails are also a separate article of commerce, and sell from four to eight pounds a hundred.

The time of hunting the sable in Siberia and other countries, is from November to February, during which period the skins are in the highest perfection. Those taken at any other time of the year are far inferior, on account of the irregularity of the length of the hair; and, consequently, bring lower prices.

Instances have occurred, where the skins were of a snowy whiteness; but these are exceedingly rare, and sell high, as curiosities.

The principal hunting of the sable is carried on by criminals, banished to the snowy confines of Siberia; and in this employment, they are frequently exposed to great privations. They are obliged to furnish each a certain number of skins; and, for their encouragement, are permitted to share among themselves whatever skins they procure above the allotted number. In the pursuit of sables, the hunters form themselves into small troops, under a leader of their own choosing. They penetrate far into the bosom of the mighty woods which cover this desert region, from whence they can only find their way back, by marking the trees as they advance; and by missing which on their return, they frequently perish, from their stock of provisions being exhausted before they can reach the confines of the forest. The pursuit of the sable is an arduous one; for, after they have traced the animal, by the track on the snow, to its retreat, they place their net over its hole, and are sometimes obliged to remain for days, watching it, till hunger forces the creature out. Such are the hardships our fellow-men are often exposed to, for the gratification of vain show among the luxurious and opulent.

PLATE CXCII.—ORNITHOLOGY.

Order PASSERES. Genus COLUMBA.

FIG. 1. *Bronze-winged Pigeon. Columba Chalcoptera*, LINN. and CUV.

The male of this species measures fifteen inches and a half in length: its forehead is of a pure white, with slight tinges of rose; this colour becomes violaceous as it approaches the occiput, and forms a dark stripe through the eyes: the nostrils are covered with small white feathers: the prevailing colour of the plumage is of an ashy-brown, each feather bordered with a yellow line: the greater wing-coverts have a brilliant spot towards their extremities, of a splendid bronzed copper, varying according to the position of the light to different tinges of red and green; this passes in the form of a double band across the wings: the smaller and middle coverts have also several irregular patches of the same colour, and they are terminated with grayish yellow.

This is one of the most brilliant of the whole genus, and is abundant in New Holland and many of the surrounding islands, and those of the Pacific Ocean. They are fond of sandy and

desert tracts, appearing from September to February, and are chiefly found in pairs: their nest is found either upon some low tree or on the ground: they lay two white eggs, and the young are hatched about November: their principal food consists of a fruit somewhat resembling a cherry, the stones of which have been found in abundance in their stomachs. It is very easy to find their place of retreat, as they are continually making a loud cooing, which is said to resemble the lowing of a cow at a distance. They are known by the English in New Holland by the name of Ground Pigeon, being unable to take long flights, and being observed principally on low trees, or on the ground.

FIG. 2. *Garnet-winged Pigeon. Columba Crythroptera*, LINN. and CUV.

Nine inches and a half in length: beak dusky yellow, or black: the forehead white; from thence a streak of the same passes over each eye to the hind head, which is black, as is also the nape: the lower part of the neck behind, the shoulders, and the wing-coverts are of a fine deep garnet colour: the back between the wings, the quills, tail, lower part of the breast, belly, and vent are all black: the tail is grayish-ash colour at the base, and the end black: the under part plain dusky: the legs brown.

This varies slightly, having the forehead, throat, fore part of the neck, and breast, white; hind part of the neck dusky: over the eye a ferruginous streak, passing a little downward on each side of the neck: back dusky black: belly dusky: quills and tail blackish: in other respects similar to the above: this variety most probably indicates only a different sex, or a younger bird.

Native of the Society and other Islands of the vast Southern Pacific Ocean.

FIG. 3. *Great-tailed Pigeon. Columba Macroura*, LINN. and CUV.

This bird is remarkable for the great size of its tail, which occupies above half the length of the body: the head, the neck, and the whole of the upper parts of the body, the wings and the tail, are of a reddish cinnamon-colour: the breast is of a vinaceous red; and the whole of the under parts of the body are reddish white: the throat is white, as are the lateral feathers of the tail: the beak and legs are red. Inhabits Senegal and other parts of Africa.

FIG. 4. *Nicobar Pigeon. Columba Nicobarica*, LINN. and CUV.

Beak dusky: irides hazel: the head, neck, breast, belly, thighs, and under tail-coverts of a dark blueish purple: the feathers on the neck are very long and pointed, reflecting rich hues of blue, red, gold, and copper: at the base of the beak is a depressed caruncle: the back, and upper parts of the wings, rich green, changing to copper and gold; some of the outer quills, and the coverts above them, bright blue: the tail and upper coverts white: legs reddish: the female differs in the colours being less brilliant, and in the pointed feathers of the neck being shorter; she is also destitute of the caruncle at the base of the beak. Inhabits the Moluccas, and other of the Indian islands.

This bird has a great affinity to those of the genus Columba, but may be readily distinguished from them by the form of the beak and other parts, as detailed in the generic character: its manners too are totally different; it lives on the ground, and subsists upon fruits.

FIG. 5. *Hook-billed Pigeon. Columba Curvirostra*, LINN. and CUV.

This species is common in the Isle of Java, in Tanna, Ceylon, and the adjacent islands; also on the Indian continent: it delights in the fruit of the ficus religiosus, and generally frequents the borders of great woods.

FIG. 6. *Cape Turtle. Columba Capensis*, LINN. and CUV. Inhabits Southern Africa.

FIG. 7. *Great crowned Pigeon. Columba Coronata*, LINN. and CUV.

This is the largest bird of this order known, exceeding a Turkey in size: its beak is black, and from its base arises a streak of that colour, which passes through the eyes as far as the hind head: the head is ornamented with an erect superb circular crest, the feathers of which it is composed being upwards of four inches and a half in length, of a loose texture, and of a fine pale blueish-ash colour: the rest of the head, the neck, breast, belly, sides, thighs, and under tail-coverts, gray-blue: the rump and upper tail-coverts deep ash: the back and scapulars the same, with a mixture of purplish chestnut; as are also the tips of the lesser wing-coverts; the greater ones, nearest the body, ash-coloured within, and white on the outside, and tipped with purplish chestnut: the quills deep dusky ash: tail the same, but paler at the tip: the legs are dusky: the irides red.

These birds have many of the manners of the common Pigeons; billing, inflating their breast, and cooing; its note is, however, so loud, at times, as to resemble a kind of lowing; and its mournful notes alarmed the crew of Bougainville greatly, on hearing them, for the first time, in the wild and unfrequented spots of some of the islands on which they landed; they supposing the noise to be uttered by some of the savages of those parts. They are easily tamed, and in the East Indies are kept in court-yards as poultry. In a wild state, they build and breed in the highest trees. They inhabit the Moluccas and New Guinea.

PLATE CXCIII.—ORNITHOLOGY.

Order ANSERES. Genus LARUS. Genus STERNA. Genus RYNCHOPS.

Genus LARUS, GULL.

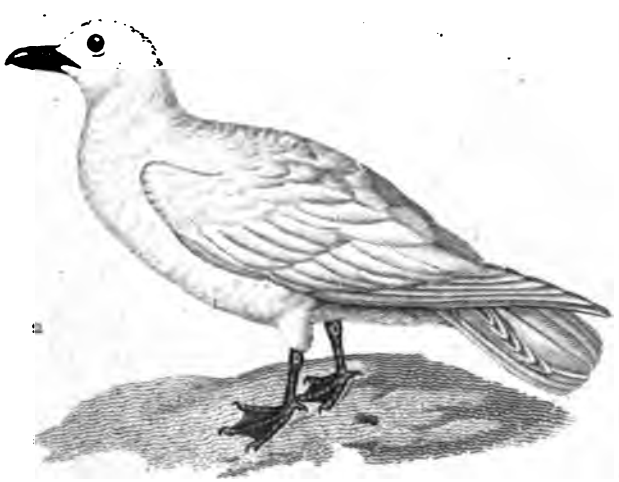
Gulls are voracious and cowardly birds, which swarm on the sea-coasts, although some are found also on the margins of fresh-water lakes and rivers: their food consists indifferently of living or dead fishes, their fry, or carrion. They endure the most severe tempests, flying almost continually; but when at rest often repose on the surface of the sea, in preference to that of its coasts. The sexes resemble each other; excepting that the female is rather smallest: the young differ much from the old, and do not obtain their perfect plumage till the second or third year, which causes great difficulty in ascertaining and describing the species; the characters by which the adult birds may be known are, the white on the tail being without spots or black bands, and the beak being destitute of black spots. Until the third year, the young live in small flocks detached from the old. The appearance of Gulls far inland is generally indicative of approaching severe weather or storms.

FIG. 1. *Arctic Gull. Larus Parasiticus*, LINN. *Lestris Parasiticus*, CUV.

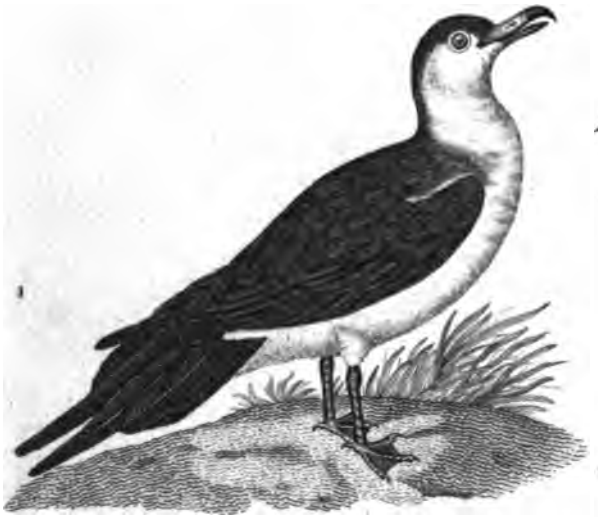
This species is abundant in the Arctic regions; and also in the Hebridal Islands and the Orcades, and other northern countries: it is very scarce towards the south of Britain, never having been observed farther in that direction than the coasts of Yorkshire, excepting the young, which has been taken near Horsham, in Sussex, near Oxford, and on the coast of Lancashire. It breeds in the northern regions, and in the Hebrides: its nest is composed of dry grass: the eggs are two in number, very light brown, marked with irregular dark brown blotches.

FIG. 2. *Ivory Gull. Larus Eburneus*, LINN. and CUV.

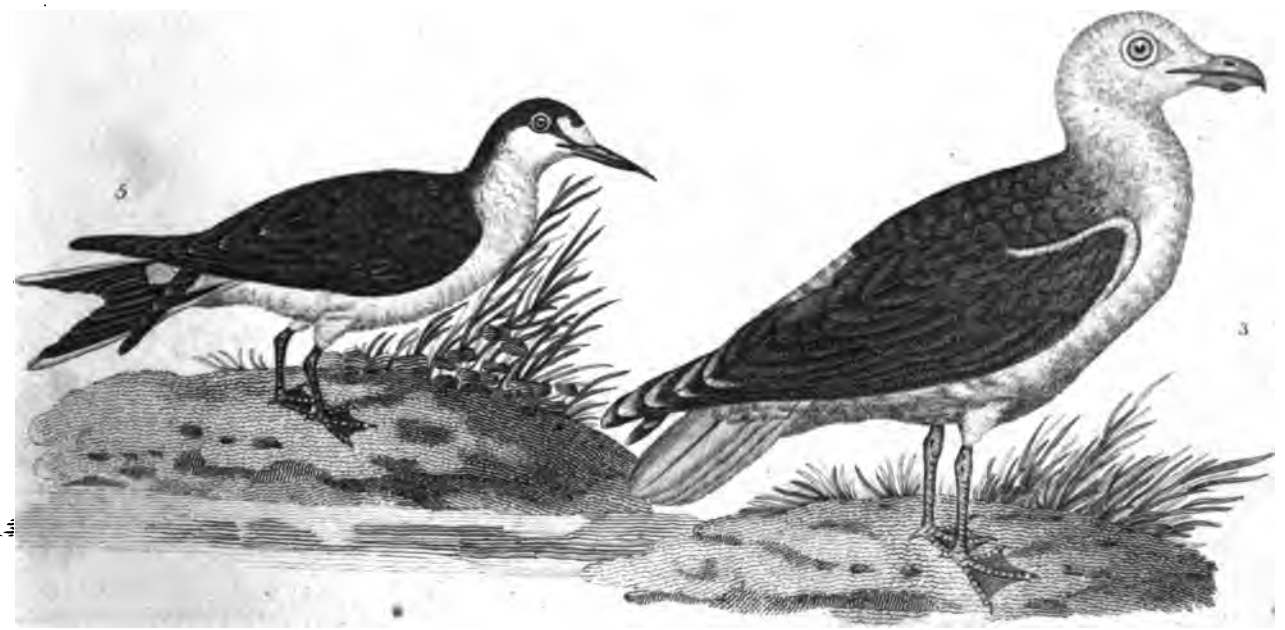
This bird inhabits the coasts of Greenland and Spitzbergen,











GENUS *LARUS* (Gull)

1.L. *Parasiticus* ARCTIC G.

2.L. *eburneus* IVORY G.

3.L. *Marinus* BLACK BACKED G.

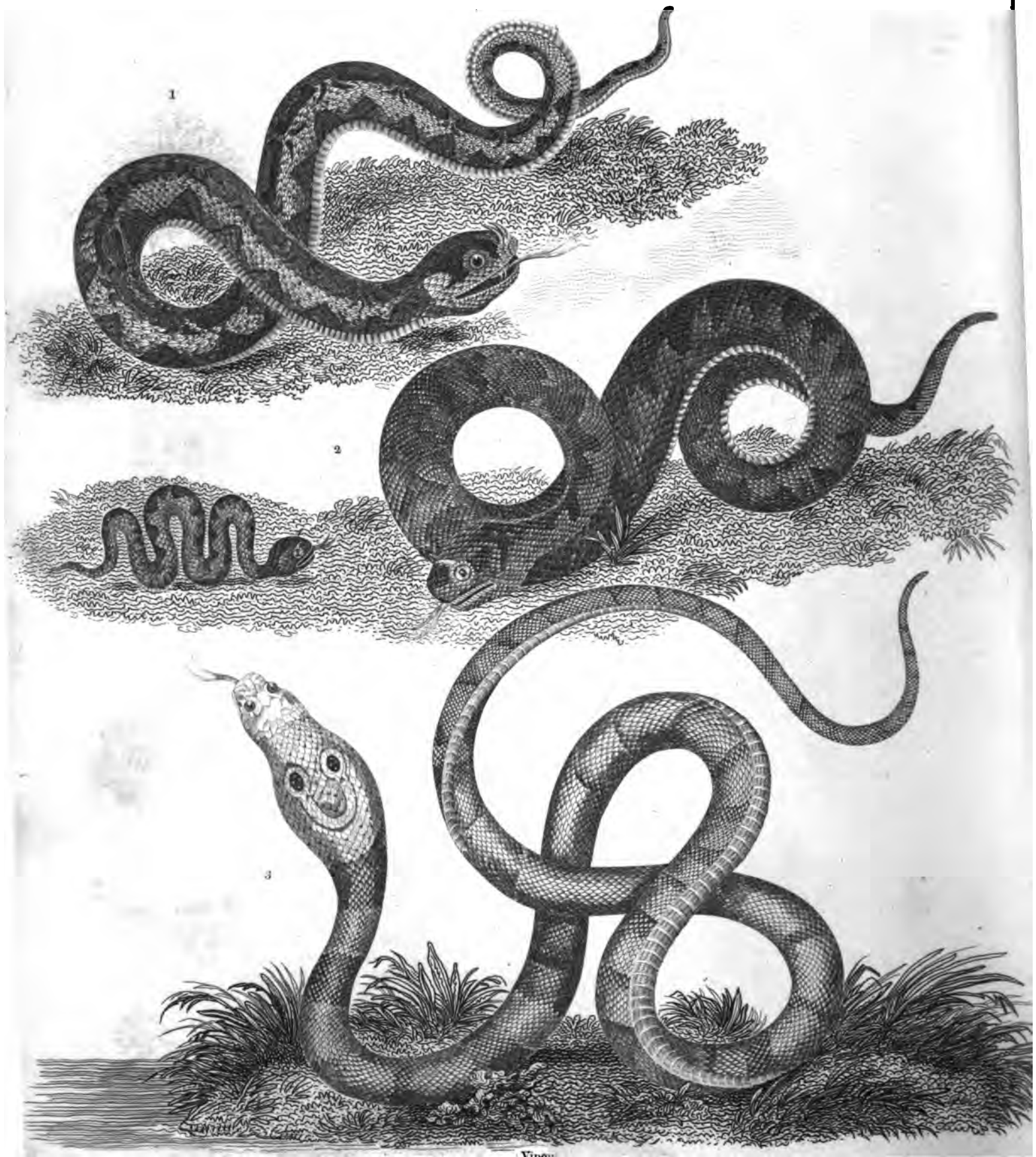
G. *STERNA* (Tern)

4.S. *Caspia* CASPIAN T.

5.S. *stolida* NODDY S.

G. *RYNCHOPS* (Skimmer)

6.R. *Nigra* BLACK S.



Viper.

1.C. cornutus — HORN NOSE V.

2.C. Cerastes — CERASTES V.

3.C. Naja — NAGOO or SPECTACLE V.

Edwards Sc.

and is found at a distance from land, which it is said rarely to visit, except for the purpose of incubation. Very little is known of its manners: it appears to be fond of whale blubber, which attracts great numbers.

FIG. 3. *Black-backed Gull. Larus Marinus*, LINN. and CUV.

This is the largest of the Gulls, being nearly thirty inches in length.

This species prefers the sea-shores, rather than the ocean; it is abundant in all the northern parts of Europe, the coasts of Greenland, and of those of the Orcades and the Hebridal Islands, and of the north of England; but on the latter they are in less abundance: they breed on the highest cliffs which overhang the sea: their eggs are three or four in number, of a dark-olive colour, marked at their thicker end with several large and small spots of dusky-brown. They feed on the smaller fishes and their fry, carrion, and sometimes on the inhabitants of bivalve shells. Their cry is very hoarse and disagreeable, resembling the loud cackling of a Goose.

Genus STERNA. TERN.

These birds are readily distinguished by the great length of their wings and their forked tail, as well as by the form of their beak. In manner they somewhat resemble the Noddies, but are less stupid. They are more generally distributed over the globe, and are abundant in the temperate regions: their colours are of a gayer description than either those of the Vivalres or Noddies; the predominating hue being a beautiful ashy-lead colour, often tinged with rosy.

Terns are perpetually on the wing, and when they rest seldom alight upon the water, but prefer the land, as they are bad swimmers. Their nourishment consists almost exclusively of small live fishes, which they seize upon while on the wing, descending like a shot to the water, and capturing their prey.

FIG. 4. *Caspian Tern. Sterna Caspia*, LINN. and CUV.

The Caspian Tern is upwards of twenty inches in length: its beak is crimson: the irides are dull: the forehead, crown, hind head, and round the eyes, are deep black, with a few dots of white: on the lower eye-lid is a small whitish crescent: the hind part of the neck, and all the upper parts of the body, the rump, and tail, are pure snowy white: the first six quills are deep ash-colour, the margins and tips blackish; the rest are coloured the same as the back: the legs are black.

Common in the Caspian Sea and its vicinity: it lays two or three large ashy-green eggs, spotted with brown. Its manners somewhat resemble those of the Gulls; and its voice is similar to the noise made by a person laughing.

Genus RHYNCHOPS. SKIMMER.

The Skimmers are distinguished from all other birds by the very extraordinary form of their beak, which has its upper mandible considerably shorter than their under, and grooved beneath, so as to receive the edge of the lower, which is extremely thin; the sides of both mandibles have several slight furrows: the nostrils are large and pervious, and placed in a hollow near the base and edge of the upper mandible, where it projects greatly over the lower. The tail is forked; and the legs and feet are very similar to those of the Tern, to which genus these birds are also greatly allied, from their long wings and manners of life. There are two species known.

FIG. 6. *Black Skimmer. Rhynchops Nigra*, LINN. and CUV.

This species inhabits various parts of the American continent, from New-York to the Brazils. It is generally on the wing, and skims on the surface of the water, continually dipping in its beak to take up the small fish, which are its principal food: in stormy weather it seeks the shore, and chiefly subsists upon shrimps, small crabs, &c. Its voice is harsh and screaming, resembling that of the Terns, but stronger. It flies slowly, dipping occasionally, with steady expanded wings and bended neck, its lower mandible into the sea, and with open mouth receiving its food as it ploughs along the surface: it is rarely seen swimming on the water; but frequently rests in large parties on the sand-bars at low water. On the coast of Virginia, these birds may be observed in flocks of several hundreds together; and upwards of twenty nests have been found within the space of a square rod: the nest is a mere hollow formed in the sand, without any other materials: the female lays three eggs, almost exactly oval, of a clear white, marked with large round spots of brownish-black, and intermixed with others of pale ink colour: they are frequently eaten, but have a fishy taste: the female sits on them only during the night, or in wet and stormy weather. The young are at first so exactly of a colour with the sand on which they sit, as to be with difficulty discovered: they are several weeks old before they fly, during which time they are assiduously attended by the parents: when the young are able to leave, they depart to other coutries, but rarely proceed far out to sea.

PLATE CXCIV.—AMPHIBIA.

Genus COLUBER. SNAKE.

This is by far the most numerous of all the Linnæan genera of Serpents, and the species differ greatly in size and habit, according to their respective tribes; some, as the Vipers, having large, flattish, and subcordate heads, with rather short than long bodies and tails; while others, as the major part of the harmless serpents, have, in general, small heads, with longer bodies and tails in proportion. In some few species, exclusive of the usual subcaudal scales, are a few *scuta* or undivided lamellæ, either at the beginning, or towards the tip of the tail. It is to be observed, that in the investigation of this genus the *subcaudal scales*, though alternate, are reckoned by pairs, so that the number marked under the respective species is always to be understood to mean so many pair.

FIG. 1. *Horn-nose Viper. Coluber Nasicornis*, LINN. and CUV.

The Snake here represented, adds to the number of those malignant reptiles whose bite, in the hotter regions of the globe, proves the dreadful forerunner of a speedy and painful death.

This animal exhibits a richness and magnificence in the pattern of its robe, which cannot be viewed without admiration, though the colours separately considered are far from brilliant; and, like those on the plumage of the Wryneck, produce their effect from the curious manner in which they are disposed and blended.

The Horn-nose Snake is supposed to be a native of the interior parts of Africa. Length about thirty-five inches.

FIG. 2. *Cerastes Viper. Coluber Cerastes*, LINN. *Vipera Cerastes*, CUV.

The Cerastes or Horned Viper, which commonly grows to the length of about a foot or fifteen inches, and sometimes to a larger size, is distinguished by a pair of horns or curved processes, situated above the eyes, and pointing forwards: these horns have nothing analogous in their structure to the horns of quadrupeds, and are by no means to be considered in the light of either offensive or defensive weapons: they increase, however, the natural antipathy so generally felt against the serpent tribe, and give the animal a more than ordinary appearance of malignity. The Cerastes is a native of many parts of Africa, and is principally found in sandy deserts and dry places.

The Cerastes often makes its appearance among the numerous hieroglyphic figures on the various remains of Egyptian antiquity: and is particularly conspicuous on a pair of large

sculptured stones brought from Alexandria, and preserved in the British Museum, and which, probably, made a part of the cornice of some magnificent temple.

This animal, like some other poisonous serpents, is supposed to be viviparous.

Fig. 3. *Nagoo*, or *Spectacle Viper. Coluber Naia*, Linn. *Naia vulgaris*, Cuv.

The Coluber Naia, or Cobra de Capello, is a native of India, where it appears to be one of the most common, as well as most noxious, of the Serpent tribe; very frequently proving fatal, in the space of a few minutes, to those who unfortunately experience its bite. Its remarkable form and colours are such as to distinguish it with great ease from almost every other snake. Its general length seems to be three or four feet, and the diameter of the body about an inch and a quarter.

PLATE CXCV.—ENTOMOLOGY.

The annexed plate represents several species of the genus Gryllus, of Linnæus. The characters given it by that great naturalist, are,—an inflected head, armed with jaws; feelers filiform; antennæ setaceous, or filiform; wings four, deflected and convoluted, the lower ones plaited; posterior legs formed for leaping, and the claws double on all the feet.

This diffuse and very general character includes several families, and some of these so exceedingly dissimilar, that Linnæus was under the necessity of dividing them into five sections; and later Entomologists have carried the subdivision much further, of which we shall give some examples.

Fig. 1. *Gryllus dux*, Linn. and Lat.

This is a true Gryllus: it has the thorax carinated and rough; wing-cases green; wings rufous, spotted with brown. It inhabits South America.

In the larva and pupa state, it nearly resembles the perfect insect; the larvæ only differing in the absence of wings and wing-cases; and the pupa in possessing merely the rudiments of those parts.

Fig. 2. Represents the *Pupa of a Gryllus.*

In the Locustæ, the antennæ are setaceous, and of many joints; feelers unequal and filiform; jaw tridentated at the tip; lip bifid; head large and ovate; wing-cases compressed and membranaceous; abdomen elongated and compressed, that of the female terminated in four short styles; the female with an ensiform tube: posterior legs long, and formed for leaping: tarsi of four joints.

Fig. 3. *Locusta viridissima*, Fab. *Gryllus viridissimus*, Linn. Two inches long, green, and immaculate; ovipositor of the female, straight.

Fig. 4. Larva of a *Locusta.*

In the genus Acrydium, the antennæ are filiform, and inserted under the eyes; feelers filiform and equal; lip ovate and cleft at the tip; head ovate, and inserted; thorax carinated; scutal covering the wings; legs short, except the posterior pair, which are long, and formed for leaping.

Fig. 5. *Acrydium subulatum*, Fab. *Gryllus subulatus*, Linn. Of a dark brown colour. Inhabits the North of Europe.

The genus Truxalis is marked by its compressed, prismatic, ensiform antennæ, and by its pyramidally raised head.

Fig. 6. *Truxalis nasutus*, Fab. and Lat. *Gryllus nasutus*, Linn.

In the genus Grillotalpa, the tibiæ and tarsi of the two anterior legs are wide, flat, and dentated, resembling hands; and are adapted for digging.

Fig. 7. *Gryllotalpa vulgaris*, Lat. *Gryllus vulgaris*, Linn. This species inhabits Europe, and does vast mischief in gardens and cultivated grounds, their habits somewhat resembling those of the mole.

PLATE CXCVI.—ENTOMOLOGY.

The annexed plate represents several species of the Linnæan genera Bostrichus, Ptinus, Hister, and Gyrinus, belonging to the order Coleoptera.

In the genus Bostrichus, the insects are characterized by clavated antennæ; club solid; thorax convex, with a slight margin; head inflected, and concealed under the thorax.

Fig. 1 & 1*. *Bostrichus polegraphus*, Linn.

Fig. 2 & 2*. *Bostrichus typographus*, Linn. and Lat.

Fig. 3 & 3*. *Bostrichus piniperda*, Linn. and Lat.

Fig. 12 & 12*. *Bostrichus pubescens*, Linn.

In the genus Ptinus, the antennæ are filiform, the last joints being the largest; thorax nearly round, not margined, receiving the head.

The genus Ptinus, like that of Dermestes, consists of small insects, which, in general, have similar habits, living both in their larva and complete state among dry animal substances, and some species of dry wood, which they destroy by piercing them with innumerable holes.

Fig. 4 & 4*. *Ptinus scotias*, Linn. *Gibbium scotias*, Lat.

Fig. 5 & 5*. *Ptinus imperialis*, Linn. and Lat.

Fig. 6 & 6*. *Ptinus sex-punctatus*, Linn.

Fig. 7 & 7*. *Ptinus tessellatus*, Linn. *Anobium tessellatum*, Lat.

Fig. 8. *Ptinus pectinicornis*, Linn. and Lat.

In the genus Hister, the antennæ are clavated, and the club solid, with the last joint compressed and decurved: head retractile within the body: mouth forcipated: wing-cases shorter than the body, and truncated; anterior shanks toothed; hind shanks spinous. In the larva, as well as in the adult state, these insects are often seen in the dung of animals.

Fig. 9 & 9*. *Hister unicolor*, Linn. and Lat.

Fig. 10 & 10*. *Hister planus*, Linn. and Lat.

In the genus Gyrinus, the antennæ are clavated and rigid; jaws horny, single-toothed, and sharp-pointed; eyes four, two above and two beneath: thorax and wing-cases margined, the latter shorter than the body.

The insects of this family are of the aquatic kind, being distinguished on the water by their shining blackness. They form rapid circles on the surface of the water, and, when disturbed, plunge suddenly to the bottom.

Fig. 11 & 11*. *Gyrinus notator*, Linn. and Lat.

PLATE CXCVII.—MAMMALIA.

Order Cetae. Genus Physeter, Cachalot. Genus Delphinus, Dolphin.

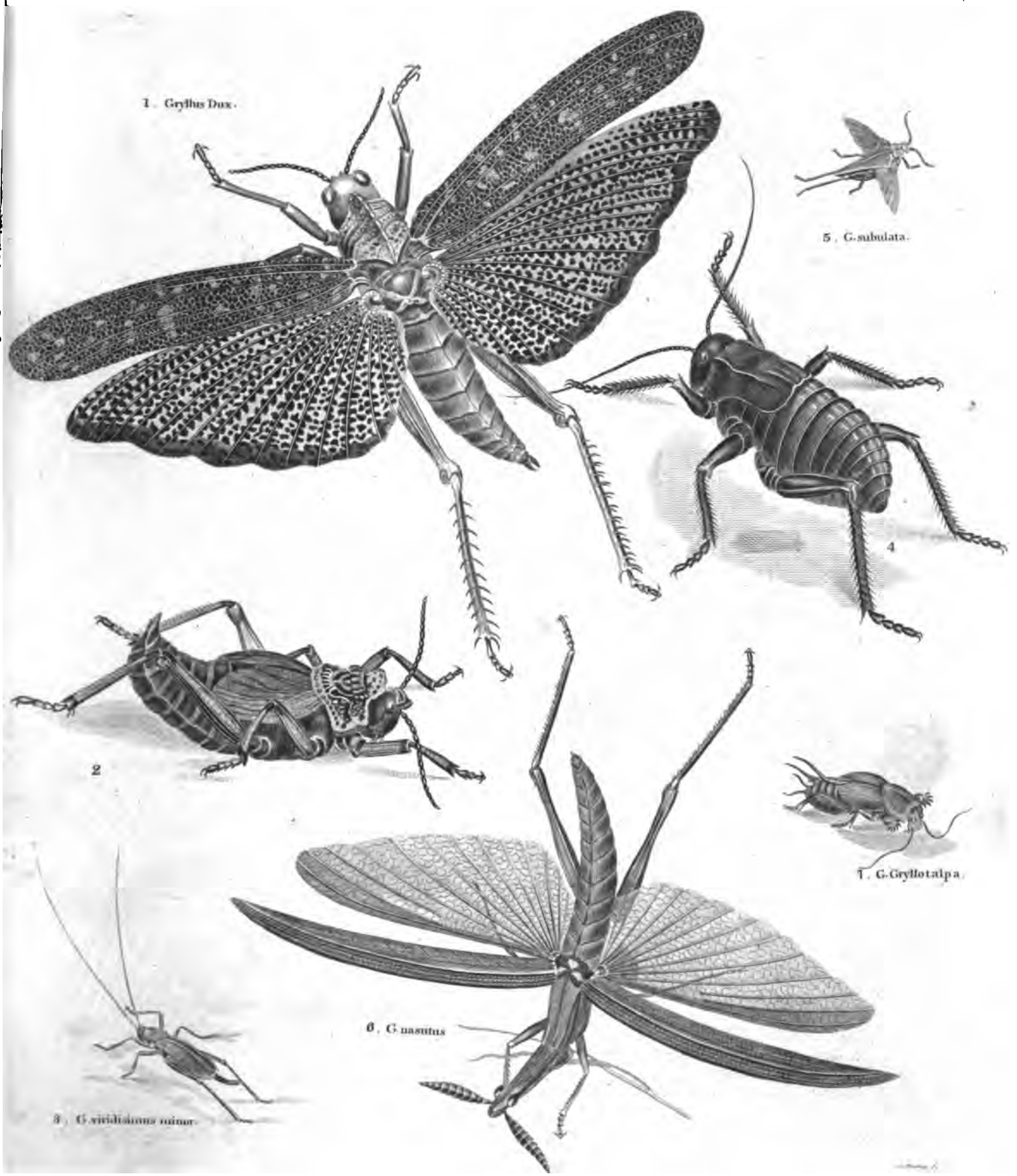
Order Cetae.

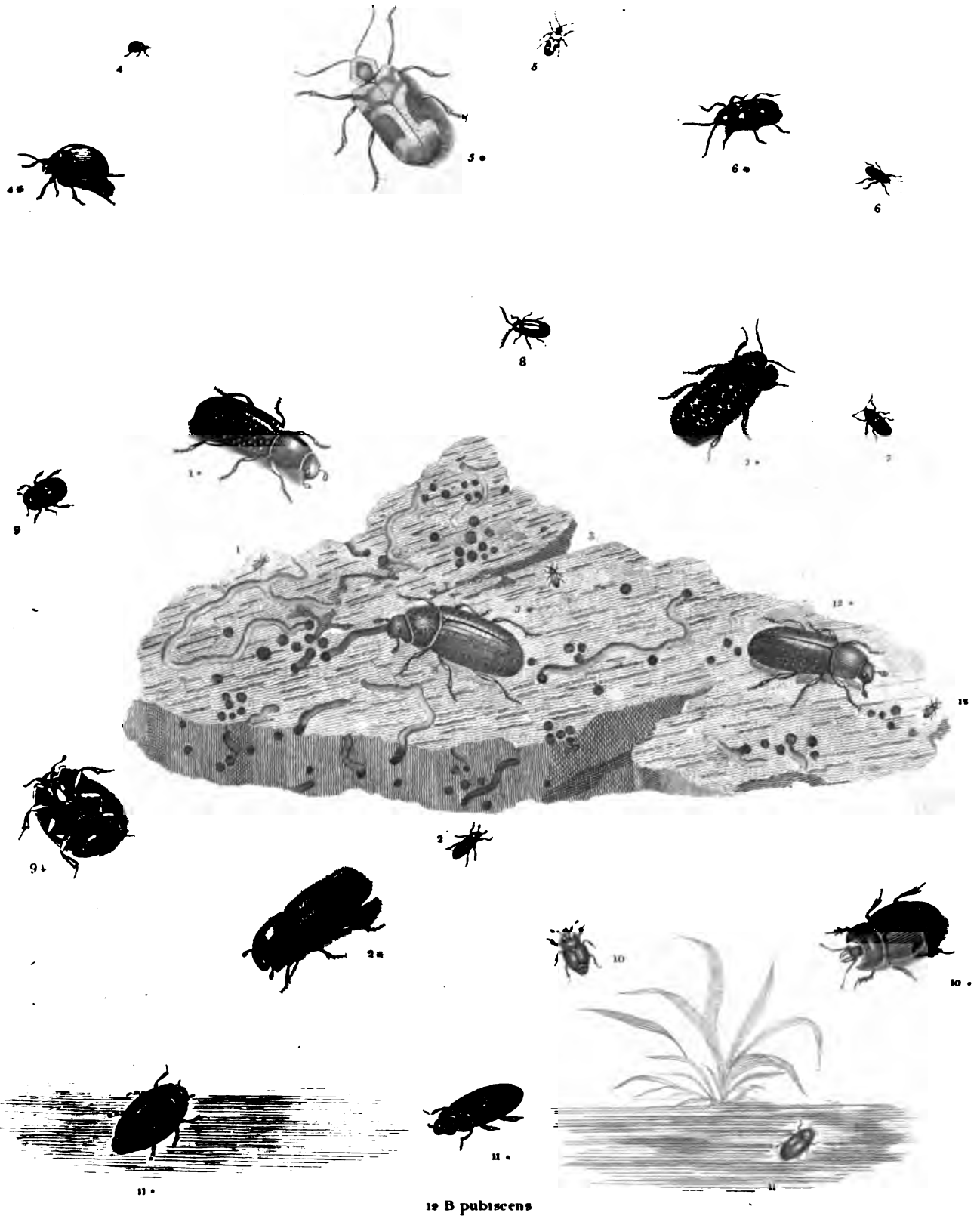
The Cetaceous animals, or Whales, however nearly approximated to Fishes by external form, and residence in the waters, are in reality to be considered as aquatic Mammalia; for though

ENTOMOLOGY.

Order Hemiptera.

Genus GRYLLUS.





1.B.polegraphus. 2.P.typographus .3.B.piniperda . 4.P.scottas 5.P.imperialis . 6. P.sex punctatus .P.fasciatus 8.P.flaccinicornis

9.H.unicolor 10.H.planus 11.G.natator • *magnified* ‘ *under surface*

CLASS MAMMALIA. ORDER CETE. GENUS PHYSETER. CACHALOT. GENUS DELPHINUS. DOLPHIN.



1.P.Macrocephalus.Blunt headed C.—2.var P.Gibbosus.Scarred.Gibbous C.—3.D.Phocena Porpoise.—4.D.Delphis Dolphin.

from their general shape, and seeming want of feet, they appear, at first view, widely removed from that class, yet we find on examination that their whole internal structure resembles that of other Mammalia, and that their skeleton is formed on the same plan; differing only in the want of hind legs, the peculiar structure of the tail supplying that defect, being extremely strong and tendinous, and slightly divided into two horizontal lobes, but not furnished with internal bones.

Their lungs, intestines, &c. are formed on the same plan as in quadrupeds. They have also warm blood, and, like other Mammalia, suckle their young. It is therefore unnecessary to add, that their true arrangement must be in the same class; but so strongly is the vulgar or popular idea respecting these animals impressed on the mind, that to this hour they are considered as Fishes by the mass of mankind; who, not having either time or inclination to become scientifically acquainted with the objects of creation, find some difficulty in conceiving how a Whale can be any thing but a fish. It should also be added, that in compliance with this popular prejudice, even Willoughby was induced to admit the Whales into his Ichthyology, Mr. Pennant to exclude them from his work on quadrupeds, and still more lately, Dr. Bloch to insert the Porpoise in his History of Fishes.

FIG. 1. *Blunt-headed Cachalot. Physeter Macrocephalus*, LINN.

FIG. 2. *Variety. Gibbous Cachalot. Phiseter Gibbous.*

This Whale, which is one of the largest species, is scarcely inferior in size to the great Mysticete, often measuring sixty feet or more in length. The head is of enormous size, constituting more than a third of the whole animal; the mouth wide; the upper lip rounded, thick or high, and much broader than the lower, which is of a somewhat sharpish form, fitting, as it were, into a longitudinal bed or groove in the upper. The teeth, at least the visible ones, as mentioned in the generic character, are situated only in the lower jaw, and when the mouth is closed, are received into so many corresponding holes or cavities in the upper: they are pretty numerous, rather blunt, and of a somewhat conic form, with a very slight bend or inclination inwards: there are also, according to Fabricius, small, curved, flattish, concave, and sharp-pointed teeth, lying almost horizontally along the upper jaw, though, from their peculiar situation and size, they are not visible like those of the lower; being imbedded in the fleshy interstices of the holes which receive the lower teeth, and presenting only their internal concave surfaces to meet the latter when the mouth is closed. The front of the head is very abrupt, descending perpendicularly downwards, and on its top, which has been improperly termed the neck by some authors, is an elevation or angular prominence containing the spiracle, which appears externally simple, but is double within. The head is distinguished or separated from the body by a transverse furrow or wrinkle. The eyes are small and black; and the ears or auditory passages extremely small. About the middle of the back is a kind of spurious fin, or dorsal tubercle, of a callous nature, not moveable, and somewhat abrupt or cut off behind. The tongue is of the shape of the lower jaw, clay-coloured externally, and of a dull red within. The throat is but small in proportion to the animal. The body is cylindrical beyond the pectoral fins, growing narrower towards the tail. The colour of the whole animal is black, but when advanced in age grows whitish beneath. It swims swiftly, and is said to be a violent enemy to the *Squalus Carcharias*, or White Shark, which is sometimes driven ashore in its endeavours to escape, and according to Fabricius, will not venture to approach its enemy even when dead, though fond of preying on other dead Whales. This Whale also devours the *Cyclopterus Lumpus*, or Lump-Fish, and many others. The Greenlanders use the flesh, skin, oil, tendons, &c. in the same manner as those of the Narwhal. It is reckoned very difficult to take; being very tenacious of life, and surviving for several days the wounds it receives from its pursuers.

It is in a vast cavity within the upper part of the head of this Whale that the substance called spermaceti is found, which while fresh and in its natural receptacle, is nearly fluid; but when exposed to the air, concretes into opaque masses: this substance being so universally known, it becomes unnecessary to describe it farther.

A more curious and valuable production, the origin of which had long eluded the investigation of naturalists, is obtained from this animal, viz. the celebrated perfume called Ambergris, which is found in large masses in the intestines, being in reality no other than the fæces.

FIG. 3. *Porpoise. Delphinus Phocæna*, LINN.

The Porpoise, or Porpesse, may be considered as the most common of the whole cetaceous tribe; being found in almost all parts of the ocean, and sometimes even entering the mouths of large rivers. In its general shape it so much resembles the Dolphin or next species, as to be frequently confounded with it; and navigators in general seem to call both species indiscriminately by the same name. The Porpesse however differs in having a shorter snout, which though somewhat sharply terminated, is much less narrow or produced than that of the Dolphin. The Porpesse is also, in general, the smallest animal of the two, and rarely exceeds the length of six or seven feet. It is of a thick form on the fore parts, and gradually tapers towards the tail, which is shaped like that of other Cetacea. The back fin is situated rather nearer the tail than the head, and is of a somewhat triangular outline, and placed nearly upright. In colour this animal resembles the Dolphin, being either of a blueish black or of a very dark brown above, and white or nearly white beneath: the eyes are small; behind them are situated the auditory passages, which are very small; and on the upper part of the front is the spiracle, which is somewhat in the form of a crescent: the mouth is of moderate width; the teeth small, rather sharp, and numerous; being commonly about forty-six or fifty in each jaw; the tongue is flat, rounded, notched or crenated on the edge, and pretty closely attached or confined to the surface of the under jaw.

The Porpesse lives chiefly on the smaller kinds of fish, and is observed to root about the shores with its snout, in the manner of a hog, while in quest of food. Like the Dolphin it is seen to gambol about in the ocean, more especially in stormy weather.

Porpesses are also observed to congregate occasionally in vast numbers, and to pursue shoals of Herrings, Mackerel, and other fish, which they drive into bays and close recesses, and prey upon them with great voracity. This animal is remarkably fat, being covered immediately under the skin with a thick coat of lard, affording a great quantity of oil.

The Porpesse was once considered as a sumptuous article of food, and is said to have been occasionally introduced at the tables of the old English nobility; and this so lately as the time of Queen Elizabeth. It was eaten with a sauce composed of crumbs of fine bread with sugar and vinegar. It is however now generally neglected even by sailors.

FIG. 4. *Dolphin. Delphinus Delphis*, LINN.

The Dolphin, as observed in the preceding article, bears a great resemblance to the Porpesse, but has a much longer and sharper snout, and the shape of the body is rather more slender. It also grows to a larger size, measuring eight or ten feet in length, and is black above and whitish beneath. The mouth is very wide; the teeth very numerous, small, sharp, and set, as in the Porpesse, in a straight row on each side of both jaws: the eyes are small, the back fin seated as in the former species, beyond the middle of the back. The Dolphin is found in the Mediterranean and Indian seas, and seems to be generally con-

founded by navigators with the Porpoise, having the same general manners and appearance. It preys on various kinds of fish, and is said to be sometimes seen attacking and wounding even the larger kind of whales. It swims very swiftly. The appearance both of this species and the Porpesse at sea, is generally considered as one of the preludes of an approaching storm. The prejudices of the ancients were of a contrary cast: with them this animal was celebrated for its supposed affection to the human race, and its appearance regarded as a prosperous omen. "The Dolphin," says Pliny, "is friendly to man, and pleased with music. He does not fly from the sight of mankind, but of his own accord meets their ships, gamboling before them, and accompanying their course, as if through a spirit of emulation; and always outstripping them, even when sailing with the most favourable wind."

PLATE CXCVIII.—CONCHOLOGY.

The beautiful shells belonging to the genus HALIOTIS, (sea-ear,) are included in the order SCUTIBRANCHIATA of Cuvier. Their shells are very open, without an operculum, and most of them without any turbinated apex; so that they cover the animal in the manner of a shield. The Haliotis, however, is slightly turbinate, its aperture is greatly expanded, and it has a row of perforations on one side.

The head of the animal is large, truncated at the extremity, furnished with a mouth and two unequal horns, one of which has an eye on the tip; the legs are very large, and when the animal is in motion appear to be fringed. It adheres so closely to the rocks, that it can only be separated by great violence, except when taken unawares.

FIG. 1 & 2. *Haliotis asinum*, LINN. and LAM. Shell smooth, oblong, brownish, with a somewhat falcated margin: within, pearly, with a pink tinge. Inhabits India.

FIG. 3. *Haliotis lævigata*, LINN. and LAM. Ovate, nearly as broad as long, smooth; back, mottled with various shades of brown.

FIG. 4. *Haliotis tuberculata*, LINN. and LAM. Shell subovate, the outside being transversely grooved, rugged, and tuberculated.

Abundant on the shores of Southern Europe, and is sometimes eaten, though its flesh is not in much esteem.

FIG. 5. *Haliotis spadicea*, LINN. and LAM. Shell triangular, grooved or undated on the back, and pearly within. Inhabits the coasts of Africa.

PLATE CXCIX.—VERMES.

Linnæus gave the name of INTESTATA to that order of animalcules which is characterized by being simple, naked, and without limbs: some are pierced by a lateral hole, or a kind of pore; while others are destitute of this arrangement.

The now received name for this series of beings, is *Entozoa*, or intestinal worms, the greater number of which inhabit the interior of other animals. They not only infest the alimentary canal and ducts that they enter into, but even the cellular membrane, the liver, and brain. The difficulty of conceiving how they get there, added to the fact of their being seen nowhere else, has induced some naturalists to suppose that they are engendered spontaneously. It is now known, however, that most of them produce living ova, or young ones, and that in others the sexes are as distinct as in larger animals. We are, therefore, compelled to believe, that they propagate their race by minute germs, which can be transmitted through the narrowest passages; and there can be no question, that these germs are often contained in animals at their birth.

The genus ASCARIS has a round body, attenuated at each end; the mouth has three fleshy papillæ, between which is a short tube.

FIG. 1. *Ascaris vermicularis*, LINN. and CUV. Infests the rectum of the human species, and is particularly common in children.

In the genus ECHINORHYNCUS, the body is round, sometimes elongated, and sometimes in the form of a sac, and provided anteriorly with a hooked, retractile proboscis.

FIG. 2. *Echinorhyncus attenuatus*, LINN.

FIG. 3. Same, magnified. Inhabits some species of fishes.

FIG. 4. *Echinorhyncus lineolatus*, LINN.

FIG. 5. *Echinorhyncus candidus*, LINN.

The genus FASCIOLA is furnished underneath the body, or at its extremity, with organs resembling cupping-glasses, by which they adhere to the viscera. They infest marine animals, and are often found in the Green-turtle.

FIG. 6. *Fasciola Lucii*, LINN.

FIG. 7. *Fasciola alba*, LINN.

FIG. 8. *Fasciola brunnea*, LINN.

FIG. 9. *Fasciola coryphænæ*, LINN.

FIG. 10. *Fasciola Bramæ*, LINN.

FIG. 11. *Fasciola binodis*, LINN.

FIG. 12. *Fasciola Leucopercæ*, LINN.

FIG. 13. *Fasciola æglefina*, LINN.

FIG. 14. *Fasciola scorpii*, LINN.

In the genus LINGUATULA, the body is oblong and depressed, and the mouth placed before, surrounded by four passages.

FIG. 15 & 16. *Linguatula abrupta*, LINN.

PLATE CC.—QUADRUPEDS.

BOS TAURUS. OXEN.

The characteristics of the Bos Taurus have a ready been described in this work.

FIG. 1 & 2. *Lincolnshire* or *Long-horned Breed.*

These cattle are distinguished from others by the length of their horns, the thickness and firm texture of their hides, the length and closeness of the hair, the large size of their hoofs, and coarse, leathery, thick necks: they are likewise deeper made in their fore-quarters, and lighter in their hind, than the other breeds in general. In size they are superior to many. The cows give less milk, though it is understood it affords more cream in proportion to the quantity.

They have generally a white streak along the back; which the breeders term *finched*, and mostly a white spot on the inside of the hough. They are more varied in colour than the other breeds, and in the bending of the horns there is a great variety.

PLATE CCI.—ORNITHOLOGY.

WATER BIRDS. Order ANSERES. Genus ANAS. SWAN.

FIG. 1. *Bernicle Goose. Anas Erythropterus*, LINN.

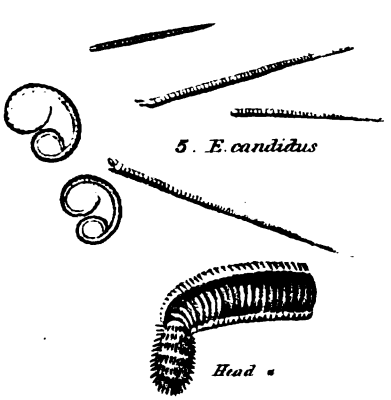
About twenty-six inches in length: the beak is black: the irides dusky-brown: the forehead, sides of the head, and the throat, are of a pure white: between the beak and the eye is a small blackish streak: the occiput, nape, neck, top of the breast,


1. Asinum
4. H.tuberculata
3. H.lævigata
2. H.Asinum
5. H.spadicea

VERMES.

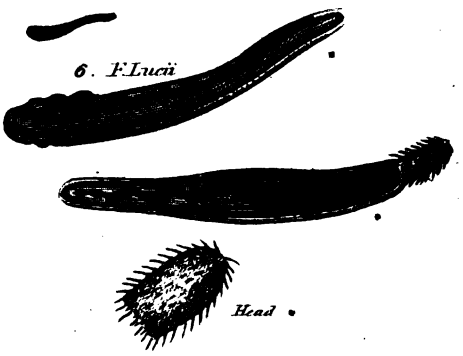
Order *Intestata*.

Genus *ASCARIS*–G. *ECHINORHINCHUS*–G. *FASCIOLA*. G. *LINGULATA*.



5. *F. candidus*

Head.



6. *F. Lucii*

Head.



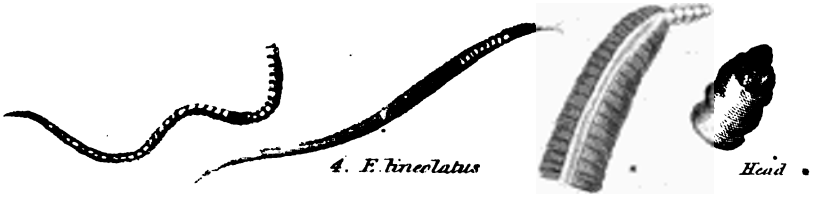
7. *F. alba*



8. *F. brunnea*



9. *F. corypheana*



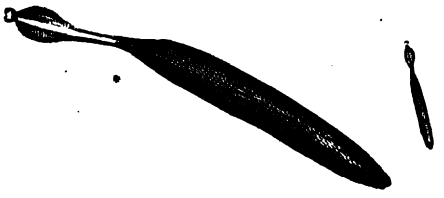
4. *F. lineolatus*

Head.



2. *F. attenuatus*

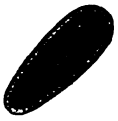
adhering to the skin of a Fish



3. *F. attenuatus*



1 *A. vermicularius*



15. *L. abrupta*



16. *L. abrupta*



14 *F. Scorpii*

13. *F. Aeglefini*





12. *F. Lucioperca*

11. *F. binodis*





10. *F. Brama*

Magnified.



Long Horned or Lancashire Breed.





GENUS *ANAS*
(Swan)

1. A. *Erythropterus.* BERNACLE COOSE.

2. A. *Canadensis.* CANADA G.

3. A. *Spectabilis.* GREY HEADED DUCK.

4. A. *Moschata.* MUSCOVY D.

quills, and tail, are deep black: the feathers of the back, the scapulars, and the wings are grayish-ash at their base, and have a broad black band towards their tip, and the tips themselves are grayish-white: all the under parts of the plumage are pure white, except the feathers on the sides of the body, which are slightly tinged with ash: the legs are black. The female is less than the male. The young of the year has a broad blackish band, formed by two small spots, between the beak and the eye: several blackish spots on the forehead: the feathers of the back and of the wings tipped by a band of bright red; and the feathers of the sides deeply tinged with ash-colour: the legs are blackish-brown. Both sexes possess an obtuse knob upon the bend of the wing.

This species inhabits the arctic regions, and in its autumnal and brumal migrations visits the more temperate regions of Holland, France, Germany, England, &c. It frequents the north-west coasts of England and some parts of Ireland in large flocks during the winter, but is rarely seen in the south, except in very severe weather. About February it retires to the north to breed, and is then found in Russia, Lapland, and other high latitudes.

The history of this bird has been rendered singularly remarkable by the marvellous accounts which were related in the darker ages concerning its growth; it being a received opinion that the Bernicle was produced in a kind of shell, the *lepas anatifera* of Linné, growing on rotten ship-timber, and other kinds of wood and trees which lay under water on the coasts! Nay, writers of no mean repute have absolutely written expressly upon the subject. Among them may be reckoned one Maier, who asserts that he opened an hundred of the shells in the Orkneys, and found in all of them the rudiments of the bird completely formed!

Few subjects seem to have been more circumstantially related, or to rest on better evidence, than the above; so natural to man is credulity, which passes all bounds, where the prodigy of an event takes firm hold of the imagination, and lays the understanding asleep. Such are some of the wild chimeras that have been detailed concerning the origin of these birds, which ridiculous fables once enjoyed much celebrity, and were admitted by many authors!—Such is the folly of mankind to give credence to every wonderful tale—such the dangerous contagion of error and superstition! Enough has been said on this subject to show how contagious the errors of science are, and how prone we are to become acquainted with, and to believe, the fascinations of the marvellous. The absurd notion of the annual submersion, or torpidity, of Swallows and Martins, so tenaciously insisted on by many persons in the present day, forms an apt accompaniment to the chimerical dreams respecting the birth of the Bernicle, and will, it is to be hoped, in its turn, disappear before the penetrating radiance and calm investigation of truth.

FIG. 2. *Canada Goose. Anas Canadensis*, LINN.

This species is in length three feet, and extends five feet two inches: the beak is black: the irides dark hazel: the upper part of the neck black, marked on the chin and lower part of the head with a large patch of white: lower part of the neck before white: back and wing-coverts brown, each feather tipped with whitish: rump and tail black: tail-coverts and vent white: primaries black, reaching to the extremity of the tail: sides pale ashy-brown: legs and feet dusky-ash. Both sexes resemble each other.

Common in a wild state in most parts of North America, and also in some of the northern regions of Europe, but domesticated in the southern. They appear in the United States during their autumnal and vernal migrations, in great numbers: their first arrival on the coast of New Jersey is in October, and if abundant are said to be a sure prognostic of severe weather: some continue all the winter, and frequent the shallow bays and marshy islands; their principal food being the broad tender green leaves of a marine plant, and also the roots of the sedge; they occasionally frequent the inlets for gravel. They swim well, and if a wing be broken, dive and go a great way under water. Their flight is heavy and laborious, and, with the exception of occasional undulations, generally in a straight line, or in two lines approximating to a point, in the form of the letter V; in both cases the van is led by an old gander, who every now and then utters his cry, which is returned by another of the party.

Wounded birds have frequently been completely domesticated, and readily pair with the tame gray Geese: the offspring are said to be larger than either, but the characteristic marks of the wild bird still predominate. On the approach of every spring, however, they discover symptoms of great uneasiness, frequently looking up into the air, and attempting to go off: some whose wings have been cut have travelled on foot in a northern direction, and have been found at the distance of several miles from home; others have actually succeeded in mounting into the higher regions of the air, and joined a passing party to the north; and Wilson relates an anecdote of one that had been caught alive in the autumn, which, upon the reproduction of its quill-feathers in the following spring, actually joined a party sojourning northward, and returned to its owner in the succeeding autumn, accompanied by two companions.

FIG. 3. *Gray-headed* or *King Duck. Anas Spectabilis*, LINN. and CUV.

Length two feet: its beak, wattles, and legs, deep vermilion: a very straight band of velvety black surrounds the base of the upper mandible of the beak, which is divided on the superior parts, and passes between its two fleshy wattles, or crests: there is a similar double band which becomes spear-shaped on the throat: the top of the head, the occiput, and the nape, are of a fine blueish-gray: the cheeks are shining sea-green: the neck, upper part of the back, wing-coverts, and two large spaces on each side of the rump, are pure white: the breast is reddish-white: the scapulars, lower part of the back, wings, tail, and all the under parts of the body, are deep black. The female is less: the feathered ridge on the tip of the beak is larger: the entire plumage brown, with the middle of each feather dusky: six of the lesser quills are tipped with white, forming a line of that colour on the wings; the rest of the quills and tail brown. The young do not attain their full plumage for some years.

Inhabits the frozen ocean of the north: is common in the Orcades and other parts of Scotland, and in profusion on the coasts of Greenland and Spitzbergen: it is also plentiful about Hudson's Bay, where it breeds on the sides of pools and rivers: the nest is made of sticks and moss, lined with down plucked from its own body. The eggs are five or six in number, and whitish: the down is much prized, and the skins are sown together by the natives of Siberia and Kamtschatka, and used for winter garments: its flesh is excellent, and the gibbous part of the beak is reckoned a delicacy.

FIG. 4. *Muscovy Duck. Anas Moschata*, LINN.

Much larger than the common Duck, being upwards of two feet in length: in its wild state it is described as being entirely of a black colour, with blue and green reflections, and white wing-coverts: domesticated, it varies much: its usual appearance is as follows: the tip of the beak and nostrils brown; the rest of it and the naked skin at its base and round the eyes red: the crown of the head slightly tufted, and black: the cheeks, throat, and fore part of the neck white, irregularly marked with black: the belly, from the breast to the thighs, white: the general colour of the rest of the plumage deep brown, darkest and glossed with green on the back, rump, quills, and tail, the two outer feathers of the latter and the three first primaries being white; the legs and feet are short, thick, and red. In the female

this naked carunculated skin is of a paler red, and does not cover so large a portion of the head as in the male: she is also somewhat smaller.

The trachea of this bird, according to Dr. Latham, is stout, nearly equal in diameter, but a trifle smaller towards the bottom; the bony arch finishes the bottom part, and appears as if furnished with rings, but they are not moveable: the orbicular labyrinth is attached to the side of it; its surface is universally rough and irregularly furrowed with fine indented lines; the opposite side runs into a pear shape, and is placed obliquely, with the point lowest, but is flattened considerably on the surface: the bony arch is on this side smooth, having no appearance of rings, and is bent at a small angle from the trachea, although it constitutes a continuance of it.

Musk-ducks are supposed to have been originally natives of South America, where they are still found wild: they are now tolerably common in a domestic state in most countries. According to Buffon, they nestle on the trunks of old trees, and when the young are hatched, the mother takes them one after another by the beak, and throws them into the water. Their eggs are larger and rounder than those of the Duck, and are frequently tinged with green: these birds are more prolific and sit oftener than other Ducks, and their flesh, which is high flavoured, is much esteemed. They have obtained the name of Musk-duck from their musky smell, which proceeds from the fluid secreted from the glands on the rump. They are naturally very wild and shy, but when kept in confinement they are more docile, and will frequently associate and produce a mixed breed with the Common Duck.

PLATE CCII.—ORNITHOLOGY.

Order Passeres. Genus Loxia. Grosbeak.

The birds of this genus have a strong and thick beak, by means of which they are enabled to break the hardest stones of fruit with the greatest facility: they are generally a shy and solitary race, chiefly residing at a distance from the abodes of man: very few of them have much beauty in their songs. Their feet have three toes before, and one behind; and their food generally consists of fruits and seeds: we have but five species of the genus indigenous.

Fig. 1. *Lineated Grosbeak. Loxia Lincola*, Linn. and Cuv.

Of this bird the beak is gibbous and black, with a white spot on the base of the upper mandible, and a line of the same colour from the forehead to the crown: upper parts of the body glossy blue-black: under parts white: base of the primary quills white, forming a spot of that colour on the wing, the rest of which is black: tail slightly forked and black. Inhabits Asia.

Buffon figures a very singular variety of this bird in the Planches Enluminées, with all the feathers on the under parts long and frizzled, which may probably be a distinct species.

Fig. 2. *Crested Dominican Grosbeak. Loxia Cucullata.*

Inhabits Brazil: head with a long pointed crest, and with the fore-part of the neck red: back and wings cinereous: under parts white: tail rather long, with the two middle feathers cinereous, the rest dusky.

Fig. 3. *Philippine Grosbeak. Loxia Philippina*, Linn. *Ploceus Philippina*, Cuv. Fig. 4. *Nest of ditto.*

This bird is said to be one of the most docile of all known birds: it is in length five inches and a quarter: beak, capistrum, sides of the head beneath the eyes, and chin, brown: irides, crown of the head, hind part of the neck, back, and scapulars yellow, with a brown spot in the middle of each feather: rump brown, margined with white; fore-part of the neck and breast yellow: abdomen and vent yellowish white: wing-coverts and quills brown, the former edged with white, the latter with pale rufous: tail the same: legs yellowish: female with the upper parts brown, edged with rufous: under parts pale rufous: this bird is occasionally found with the sides of the head above the eyes black; the black and brown mixture on the back less distinct; and the greater wing-coverts, quills, and tail greenish brown, edged with yellow.

This bird may be rendered so very tame as to come and perch on its master's hand, or to fetch and carry like a dog at command; it is called *Baya* in India, where it is extremely common; it is also found in Abyssinia and the Philippine Islands; is said to feed on fire-flies: it builds a very curious nest in the shape of a long cylinder swelling out into a globose form in the middle: it is composed of the fine fibres of leaves and grass, and fastened by the end to the branch of a high tree, generally on the Palmyra, or Indian Fig-tree: the nest is said to have two or three divisions in it, of which the true nest is in the globose part: the entrance is at the bottom of the long cylinder; it is generally suspended over water: the eggs, which resemble pearls, have the white part transparent when boiled, and are very delicious eating.

Fig. 5. *Cardinal Grosbeak*, or *Virginia Red Bird. Loxia Cardinalis*, Linn. and Cuv.

Length eight inches: beak pale red, and stout: irides hazel: head crested: round the beak and on the throat black: rest of the plumage fine red; but not so bright on the quills and tail: legs pale red: female almost entirely of a reddish brown.

This species is very tame, and has a very fine song, much resembling that of the nightingale; during the spring and summer it sits on the tops of the highest trees, singing very loud: it is often kept in cages, and generally sings throughout the year. It is fond of maize and buckwheat, and is said to collect great quantities together, which it covers with leaves and twigs, leaving only a small hole for an entrance; it is also stated to be fond of bees. It is met with in several parts of North America, appearing in New-York, and the Jerseys, about the beginning of April, frequenting the Magnolia swamps during summer, and departing in the autumn towards Carolina.

Fig. 6. *Waxen-billed Grosbeak. Loxia Astrilda*, Linn. and Cuv.

This is one of the most variable birds of the genus: it is four inches in length: beak gibbous at the base, and the colour of red sealing-wax: in colour this bird varies exceedingly; it is often found with a streak of red passing through the eye; and with the middle of the breast and belly the same colour: the upper parts of the body brown, the under reddish gray, crossed with transverse blackish lines on every part: legs, quills, and tail, brown; the latter wedge-shaped, and crossed with lines of darker brown: some birds have the vent and under tail-coverts black; and the tail plain brown.

The second variety has the head and back part of the neck cinereous: back, and wing-coverts, brown: greater quills and tail dusky: upper tail-coverts, and band on the vent, crimson: breast and belly dirty white: this is also subject to variety, as it is sometimes found with the sides of the rump and wing-coverts spotted with white, and with a yellow tinge all over the body: others again have the under parts pale yellow, and the beak and rump without any red.

The last distinct variety has a crimson streak through the eyes, in the manner of the first: with the throat, and sides of the neck, blueish-white; the rest of the under parts of the body and rump rose-coloured white: the top of the head, neck, and back, pale blue, lightest on the head: wings brown: tail blackish: legs red.

We are informed by Mr. Barrow that this bird is so abundant where it is found, that sixty-three have been shot with a small fowling-piece: it inhabits Africa, from Senegal to the Cape of Good Hope; it is also found in India, and, according to Linnæus, in Surinam.



GENUS *LOXIA*
Grosbeak

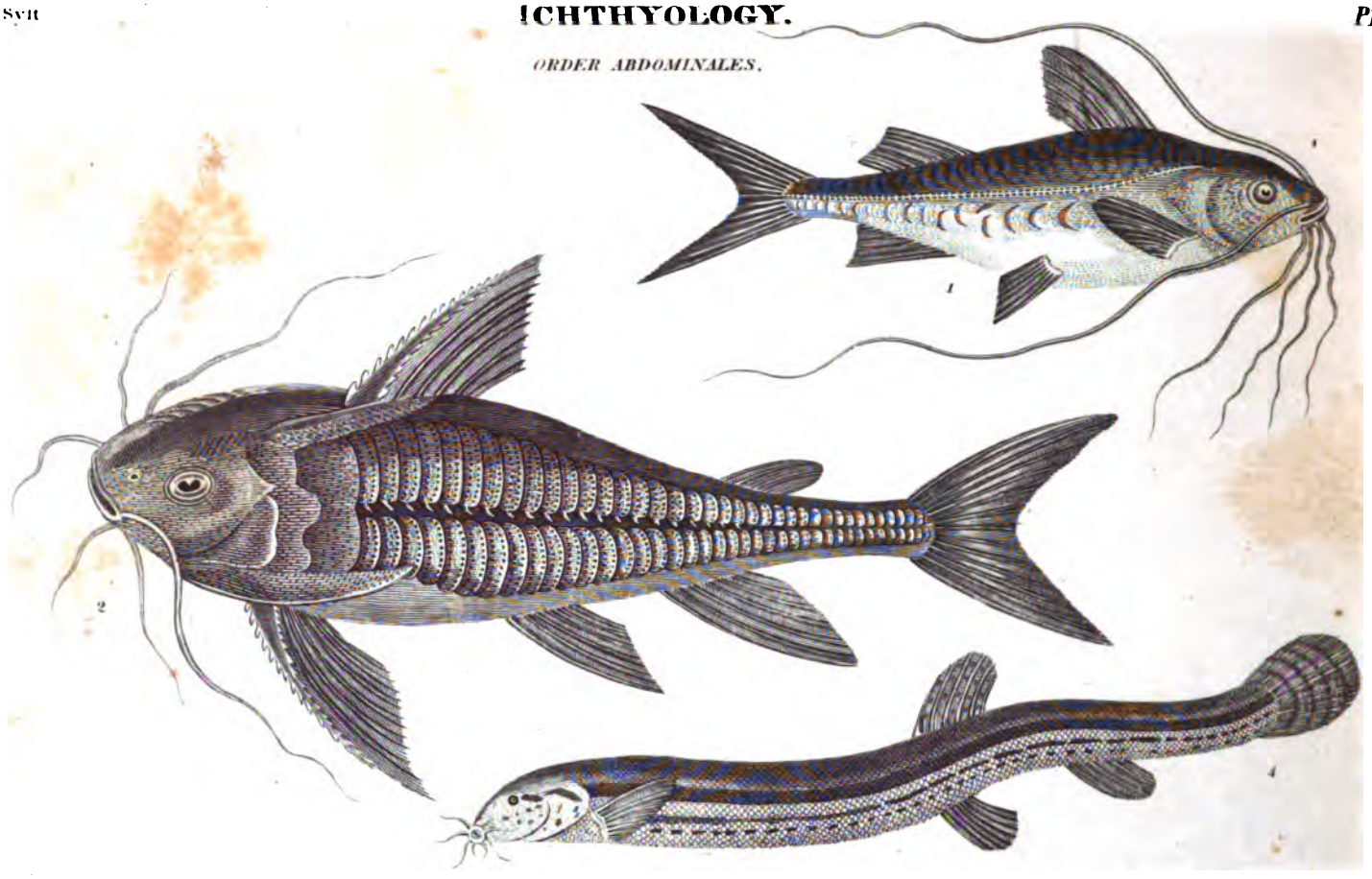
1.L. *Lineola* — LINEATED G.
2.L. *cucullata* — CRESTED DOMINICAN G.
3.L. *Philippina* — PHILIPPINE G.
4. *Nest of Philippine G.*
5.L. *Cardinalis* — CARDINAL G.
6.L. *Astrild* — WAXEN BILLED G.
7.L. *Flabellifera* — FAN TAILED G.

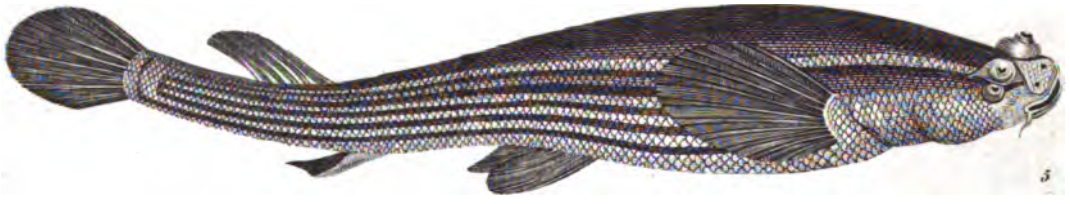


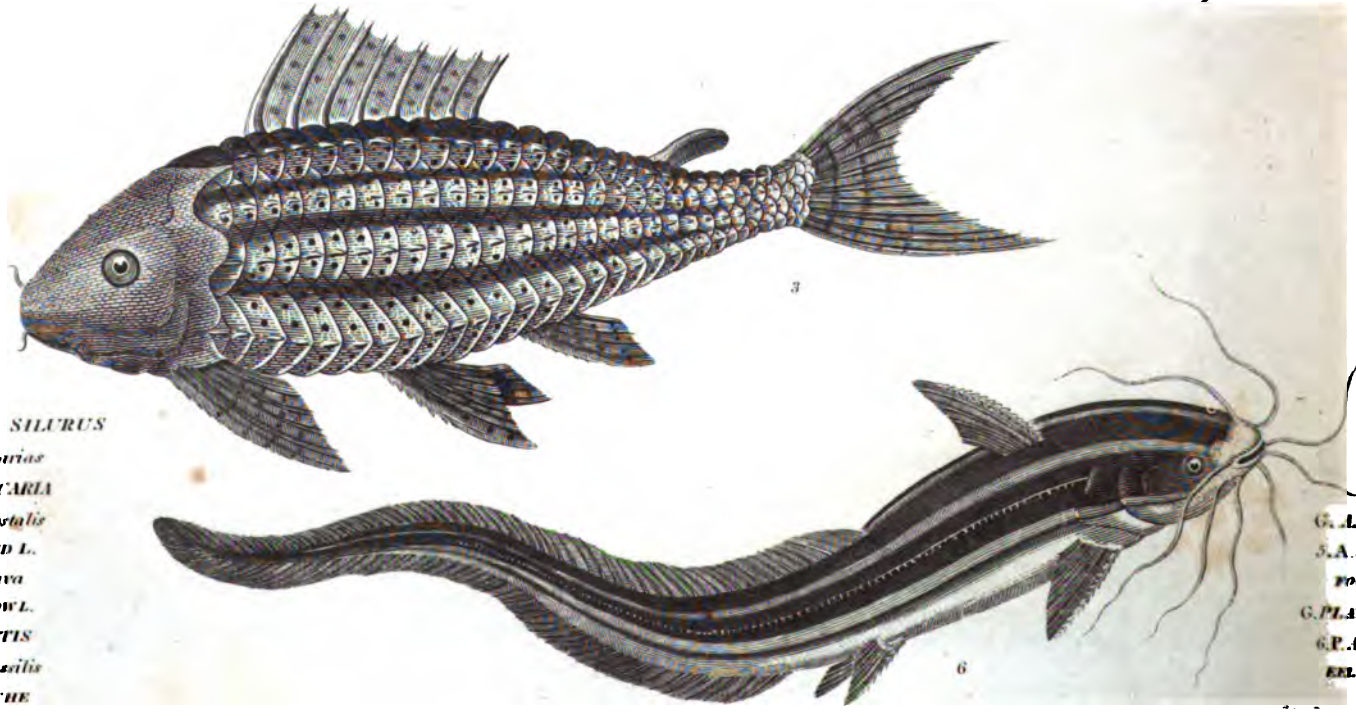
1.H. *Glubrina* COLUBRINE H — 2.H. *bicolor*. BLACK BACKED H. — 3.L. *nasuta*. SNOUTED L. — 4.A. *dubius* DOUBTFUL A.

W. Knowles Sc.

ORDER ABDOMINALES.







GENUS *SILURUS*

1.S. *clarias*

G. *LORICARIA*

2.L. *costalis*

RIBBED L.

3.L. *flava*

YELLOW L.

G. *COBITIS*

4.C. *fossilis*

G? *LOCHE*

G. *ANABLEPS*

5.A. *tetrophthalm*

FOUR EYED A.

G. *PLATYSTACHU*

6.P. *anomalurs*

EEL SHAPED P.

Fig. 7. *Fan-tailed Grosbeak. Loxia Flabellifera*, Linn. and Cuv.

About five inches in length: beak strong and dusky: prevailing colour of the plumage above reddish-brown, with the rump paler: below rather inclined to red: quills, tail, and legs, dusky: female with the breast and belly gray. Called *Fan-tails* in Virginia, from the circumstance of their carrying the tail expanded.

PLATE CCIII.—AMPHIBIA.

Genus Hydrus. Genus Langaya. Genus Achrocordius.

Genus Hydrus.

The genus Hydrus comprehends those Serpents which naturally inhabit the water, whether fresh or salt, without ever making their appearance on land, except when driven there by accident. In their general appearance they are most allied to the Angues, and are particularly distinguished by having laterally compressed or flattened tails. This genus was first instituted by Mr. Schneider, who has, however, admitted into it two species which seem more properly to belong to the genus Acrochordus.

Sea, or Water-Serpents, as Mr. Schneider observes, appear to have been known to the ancients, since they are mentioned by the Greek writers; Ælian quoting a passage from an anonymous author relative to snakes of very large size and with flat tails, produced in the Indian sea. They are also mentioned by Arrian in the *Periplus Maris Erythræi*, &c. &c. Aristotle observes, that serpents are either of land or fresh water, or else of the sea, and that these latter have a resemblance in most particulars to land-snakes, but have a head like a Conger. It is probable, however that some of the Murænæ were confounded by the ancients, as they are even by some of the moderns, with the real or proper Sea-Snakes.

Fig. 1. *Colubrine Hydrus. Hydrus Colubrinus*, Linn. *Platurus Colubrinus*, Cuv.

This species, which is much more nearly allied to the genus Coluber than any of the rest, is a native of the Indian and American seas, and is frequently seen towards the coasts of the southern islands in the Pacific. Its general length is about two feet and a half, but it probably grows to a much larger size: the head is covered with large scales: the body is cylindric, the tail terminating in a flattened and moderately dilated tip: along the whole length of the under parts is a series of scuta and of subcaudal scales, as in the genus Coluber, except that they are somewhat less distinctly continued under the compressed part of the tail: the colour of the whole animal is a strong plumbeous or livid blue, with numerous, moderately broad, deep brown or blackish bands from head to tail, each completely surrounding the body, but being rather paler beneath than above: a slight tinge of yellow is also diffused along the abdomen and over the front of the head. This is a poisonous Serpent, but the fangs are remarkably small for the size of the animal.

Fig. 2. *Black-headed Hydrus. Hydrus Bicolor*, Linn. *Pelamis Bicolor*, Cuv.

This species is readily distinguished by the remarkable distribution of its colours; the head and upper parts being of a deep black, the lower parts pale yellow, and the tail spotted: along the sides runs a row of smaller scales than the rest, and of a brighter yellow: the head is black, and is of an elongated form in front, bulging behind, subconvex above, and a little compressed laterally: it is covered with large scales: the mouth is wide; the teeth small and numerous, there being a marginal and two palatal rows in the upper jaw: the body is compressed, and the back highly carinated: the scales orbicular and very minute: the general length about two feet and a half; the tail about three inches. It is a native of the Indian seas, and is said to be common near the coasts of the island of Otaheitee, where it is called by the name of *Etoona-toree*, and is used as an article of food.

Genus Langaya.

The genus Langaya, consisting of a single species only, differs from all the rest of the serpent tribe in having the upper part or beginning of the tail marked into complete rings or circular divisions resembling those on the body of the *Amphisbæna*, while the extreme or terminal part is covered with small scales, as in the genus *Anguis*.

Fig. 3. *Snouted Langaya. Langaya Nasuta*, Linn. and Cuv.

The Langaya nasuta, or Long-snouted Langaya, is a native of Madagascar, and appears to have been first described by Mons. Bruguiere, of the Royal Society of Montpelier, whose account of it is inserted in the *Journal de Physique* for the year 1784. The length of the individual described was about two feet eight inches, and its greatest diameter about seven lines: the head is covered with large scales, but the snout, which is extremely long and sharp, projecting to a considerable distance beyond the lower jaw, is covered with very small scales: the teeth, in shape and disposition, resemble those of the Viper: the scales on the upper parts of the body are rhomboidal, of a reddish colour, and each marked at the base by a small gray circle, with a yellow spot in the middle: the under parts are pale or whitish: the number of abdominal scuta, as well as of circles on the tail, is observed to vary in this snake, as is also the colour, which in one individual was violet, with darker coloured specks on the back. The natives of Madagascar are said to hold the Langaya in great dread, considering it as a highly poisonous serpent.

Genus Achrochordius.

The body and tail of this genus are completely covered with warts.

Fig. 4. *Doubtful Achordius. Acocordius dubius*, Linn. and Cuv.

Imperfectly described by naturalists, and its native place not particularized.

PLATE CCIV.—ICHTHYOLOGY.

The genus Silurus of Linnæus, is marked as follows: the head is naked, large, broad and compressed; the mouth is furnished with cirri; the lips are thick, and the jaws furnished with teeth; the tongue is thick, smooth, and short; the eyes are small, and the gill-membrane has from four to seventeen rays: the body is elongated, compressed, and without scales; the first ray of the dorsal or pectoral fins is serrate, with reversed spines.

Linnæus divided this genus into several sections, according to the number of *cirri*. Cuvier, however, has formed a number of genera out of the Linnean Siluri.

Fig. 1. *Silurus clarias*, Linn. *Pimelodes clarias*, Cuv.

In this fish the second dorsal fin is fleshy, and the rays eleven in number. It inhabits the rivers of South America. It is said to inflict venomous wounds with the serrated pectoral fin.

The genus Doras, separated by Lacepede from the Loricaria of Linnæus, may be called a Silurus, with a second dorsal, which is adipose, and whose lateral line is mailed with a range of bony plates, each of which is relieved by a spine, or salient

carina. The dorsal and pectoral spines are strong and deeply dentated, and the helmet rough and continued to the dorsal.

Fig. 2. *Doras costatus*, Lac. and Cuv. *Loricaria costata*, Linn.

Inhabits the Indian seas; and is much dreaded by the fishermen, on account of its great boldness, and the sharpness of its spines.

Fig. 3. *Loricaria flava*, Linn.

This fish is yellow, spotted with brown: it is about ten inches long, and very beautiful. It inhabits the Indian seas.

In the genus Cobitis, the head is small, oblong, and without scales; gill-membrane with from four to six rays: gill-membrane single, and closing beneath. Body covered with small deciduous scales.

Fig. 4. *Cobitis fossilis*, Linn., Cuv. and Locke.

This species is the largest known. It conceals itself during winter, in the muddy bottoms of ponds and small streams. It inhabits various parts of Europe, and especially Germany.

In the genus Anableps, the body is cylindrical and scaly; there are five rays in the branchiæ; the head is flattened, and the jaws armed with crowded teeth. It has but one crystalline, but one vitreous humour, and but one retina; a peculiarity of which there is no other example among vertebrated animals.

Fig. 5. *Anableps tetropthalmus*, Linn. and Cuv.

With prominent eyes, and longitudinal bands. Inhabits the rivers of Guiana.

The genus Plotosus, (separated by Lacepede from the Platystachus of Linnæus,) has a second radiated dorsal, which, as well as the anal, is very long; lips fleshy and pendent; front teeth conical; those behind spherical: body and head covered by a thick, naked skin. They have eight cirri.

Fig. 6. *Plotosus anguilaris*, Cuv. and Lac. *Platystachus anguilaris*, Linn.

This fish is eel-shaped, and has longitudinal bands running the whole length of its body.

PLATE CCV.—ENTOMOLOGY.

The annexed plate represents several genera and species of the Linnæan order Diptera.

The genus Conops of Linnæus has a narrow, elongated body, the abdomen clavate, and curved underneath: the second joint of the antennæ is nearly as long as the third, which, alone or in combination with the former, forms an ovoid or fusiform club.

Fig. 1. *Conops ferruginea*, Linn. and Lat.

Fig. 2. *Conops aculeata*, Linn. and Lat.

Fig. 3 & 3*. *Conops petiolata*, Linn. and Lat.

In the genus Asilus, the mouth is furnished with a horny, projecting, bivalve, sucking trunk, gibbous at the base, and the antennæ are filiform. They fly with a humming noise, are carnivorous, voracious, and feed by suction.

Fig. 4. *Asilus teutonus*, Linn. and Lat.

Fig. 5. *Asilus gibbosus*, Linn. and Lat.

Fig. 6. *Asilus crabroniformis*, Linn. and Lat.

In the genus Bombylius, the wings are extended horizontally on each side of the body: the thorax is higher than the head, and the abdomen is conical, or triangular. The antennæ are three-jointed, and the palpi filiform. They have a long, slender proboscis, and fly with great velocity, hovering over flowers, and extracting their sweets.

Fig. 7. *Bombylius major*, Linn. and Lat.

Fig. 8. *Bombylius medius*, Linn. and Lat.

The genus Hippobosca is characterized by the mouth being furnished with a short, straight, two-valved sucker; the antennæ are filiform, and the feet armed with claws.

Fig. 9, 9 & 9*. *Hippobosca equina*, Linn. and Lat.

Fig. 10 & 10*. *Hippobosca ovina*, Linn. *Melophagus ovinus*, Lat.

Fig. 11 & 11*. *Hippobosca avicularia*, Linn. *Melophagus avicularius*, Lat.

Fig. 12, 12 & 12*. *Hippoboscus hirundinis*, Linn. and Lat.

PLATE CCVI.—ENTOMOLOGY.

The genus Tenebrio belongs to the *Coleopterous* insects, and is characterized by moniliform antennæ, with the last joint rounded; the thorax plano-convex, and margined: the head is exserted.

Fig. 1. *Tenebrio gigas*, Linn. *Blaps gigas*, Lat.

Fig. 2. *Tenebrio femoratus*, Linn. *Sagra femorata*, Lat.

Fig. 3. *Tenebrio molitor*, Linn. and Lat.

Fig. 4. *Tenebrio curvipes*, Linn.

Fig. 5. *Tenebrio culinaris*, Linn. *Phalesia culinaris*, Lat.

Fig. 6. *Tenebrio ferrugineus*, Linn.

In Pimelia, the antennæ are filiform, the feelers four; thorax plano-convex, margined: head exserted; wing-cases rigid.

Fig. 7. *Pimelia gigas*, Linn.

Fig. 8. *Pimelia sepedium*, Linn.

Fig. 9 & 9*. *Pimelia tragosita*, Lat.

The genus Helops is characterized by an elliptical, convex body; antennæ as long as the thorax, and serrated at the extremity; the thorax is sometimes square, sometimes trapezoidal: the elytra terminate in a point, or tooth.

Fig. 10. *Helops lanipes*, Linn. and Lat

Fig. 11 & 11*. *Helops fasciata*, Linn.

Fig. 12 & 12*. *Helops fusca*, Linn.

PLATE CCVII.—ZOOPHYTES.

The animalcules of the genus Tubipora inhabit simple tubes, of a strong substance; these tubes are parallel, and united from space to space by transverse laminæ, which has caused them to be compared to the pipes of an organ.

Fig. 1. *Tubipora musica*, Linn. and Cuv.

It is of a beautiful red, although the polypi inhabiting it are green. Abundant in the Indian Archipelago.

The genus Fungia of Lamarck is formed like a star, circular or in an elongated line, with very numerous laminæ.

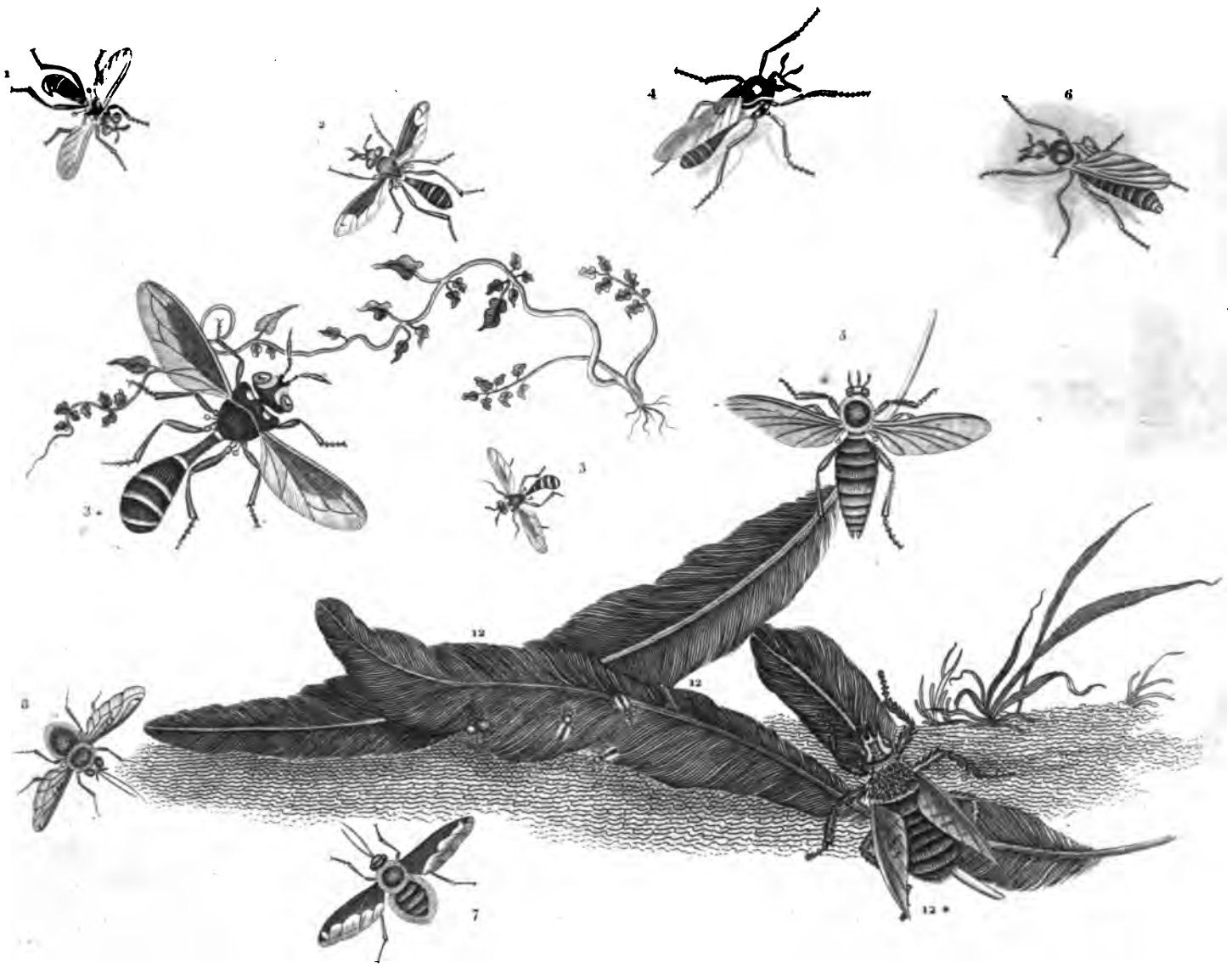
Fig. 2. *Fungia agariciformis*, Lam. *Madrepora fungites*, Linn.

Fig. 3. *Fungia pileus*, Lam. *Madrepora pileus*, Linn.

In Caryophyllia, the madrepore is ramose, and the ends are stelliform.

Fig. 4. *Caryophyllia agathus*, Lam. *Madrepora agathus*, Linn.

Fig. 5. *Madrepora foliacea*, Linn.



1. Conops ferruginea
2. C aculeata
3. C peticlata
4. Asilus teutonus
5. A gibbosus
6. A crabroniformis

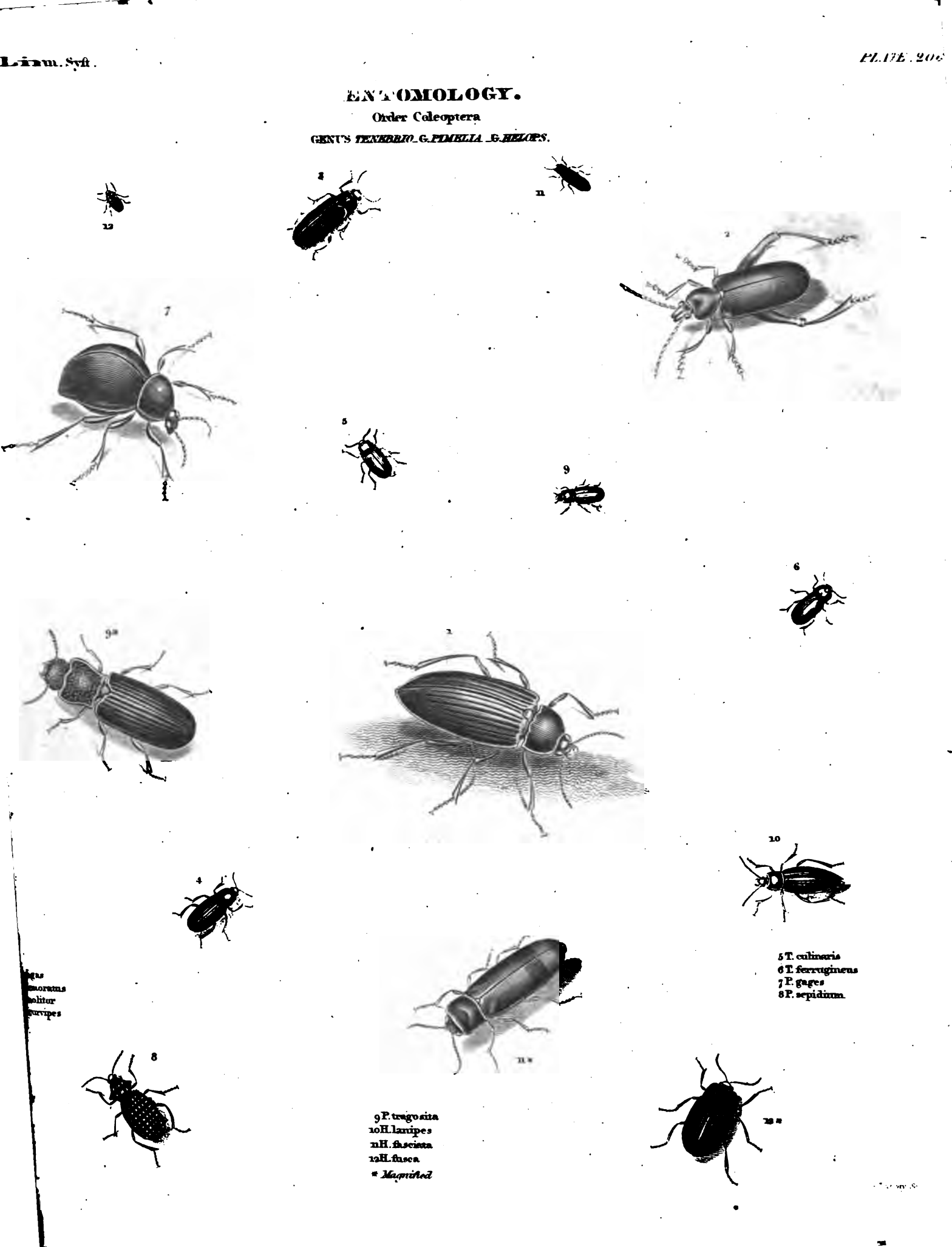
7. Bombylius major
8. B medius
9. Hippobosca equina
10. H ovina
11. H aviculari
12. H hirundin

* magnified † under surfa

ENTOMOLOGY.

Order Coleoptera

GENUS *TENEBRIO* G. *PIMELIA* G. *HELOPS*.

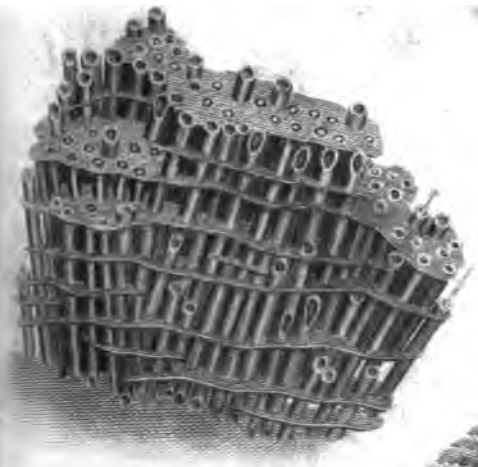


5 T. culinaris
6 T. ferrugineus
7 P. gages
8 P. sepidium.

9 P. tragosita
10 H. lanipes
11 H. fasciata
12 H. fusca
* *Magnified*

ZOOPHYTES.

GENUS *TUBIPORA* — G. *MADREPORA*.



Tubipora musica.

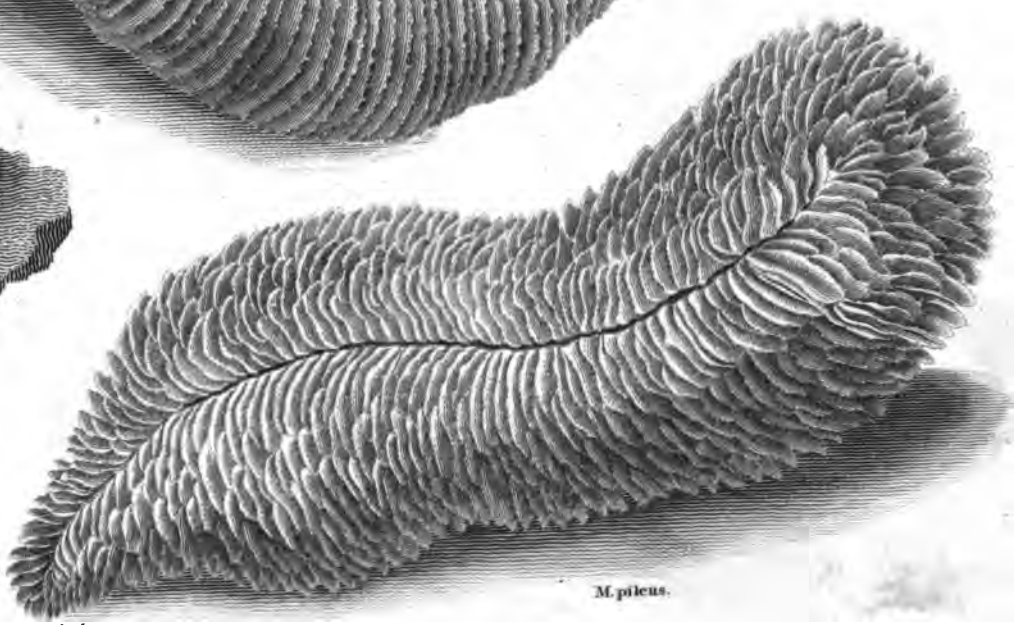
M. fungites.



Madrepora Agathus.



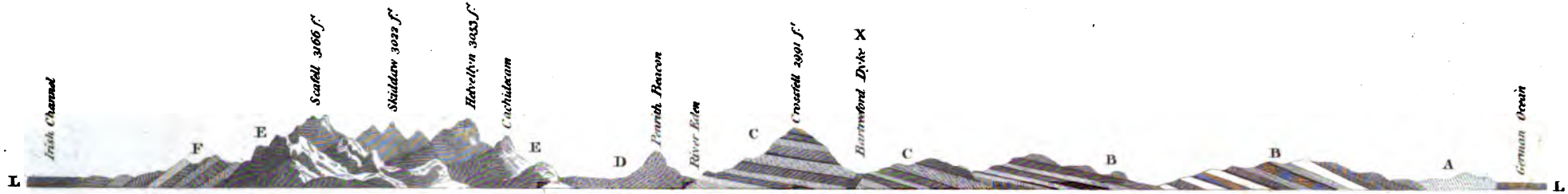
M. foliacea.



M. pileus.

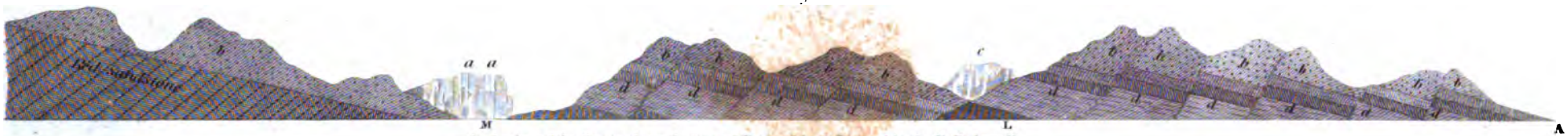
GEOLOGY.

STRATA



A Sketch of the Arrangement of the Strata through England by R Bakewell. Lat. 54.°35' to 54.°45'.

Fig. 2.



A Section of the Strata through part of Dorsetshire & Devonshire by R Bakewell.

Fig. 3.

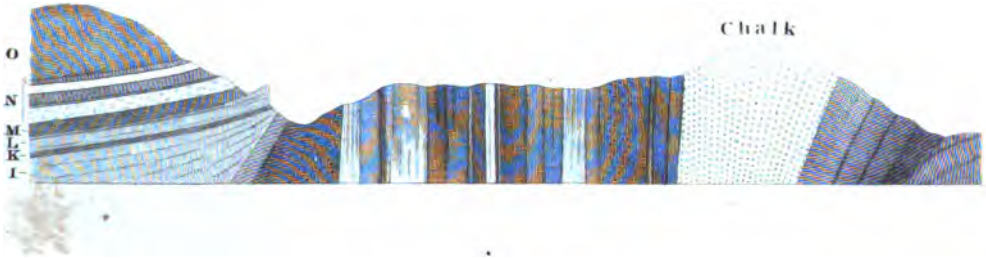


Fig. 4.

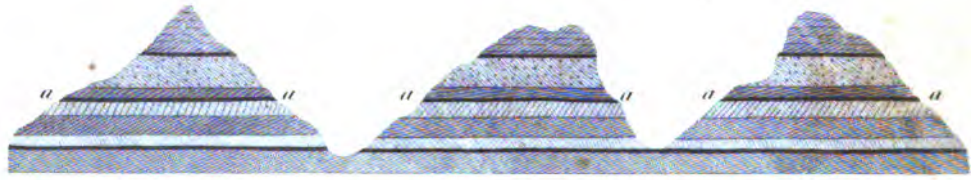


Fig. 5.

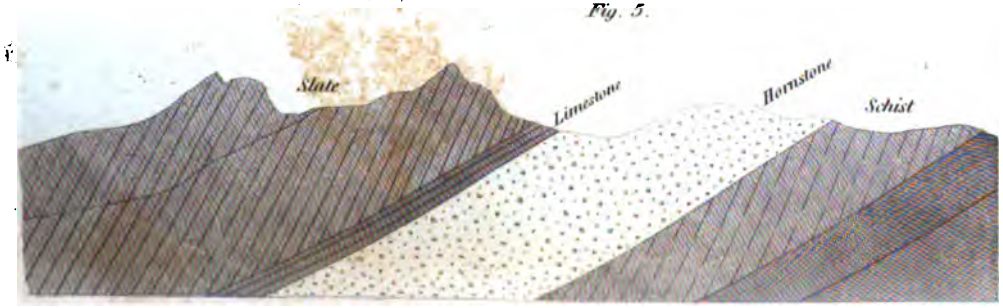


Fig. 6.



QUADRUPEDS.

Linn Syst. CLASS I.^ma^ MAMMALIA ORDER III.^tia^ FERÆ GENUS FELIS.

PLATE 209.



Fig 1 Felis Pardalis. Ocelot. 2 Felis Tigrina. Margay. 3 Felis Serval. Serval. 4 Felis Catus. Wild Cat. 5 var. Domestic Cat. 6 var. Spanish or Tortoise shell Cat. 7 var. Angora Cat. 8 var. Slate Coloured Cat, or Chartreux.

PLATE CCVIII.—GEOLOGY.

Strata.

Fig. 1. Represents the arrangement of the strata across the North of England, from the Irish Channel to the German Ocean.

The strata F, dipping to the west, belong to the coal formation on the coast of Cumberland; E E are the slate mountains of Cumberland; D represents the new red sand-stone formation, near the river Eden; C C belong to the mill-stone grit and coal formations of Northumberland; B B express the lias and oolite strata in the North of Yorkshire.

Fig. 2. This is a section across part of Devonshire and Dorsetshire, and serves to show, in a striking manner, the numerous *faults* which cross and break the strata in that part of England.

Fig. 3. This is a section of the strata seen in the cliffs in the beautiful scene called Alum Bay, Isle of Wight, Eng.

On the left are seen the various tertiary strata, resting upon one another almost horizontally. O, the alluvium, on top; N, the upper fresh-water beds; M, the upper marine beds; L, the lower fresh-water; K, clay; and I, sand. The *vertical* beds between these and the chalk, are, first the London clay, and next the many beautiful thin layers of variegated sand and clay, of the plastic clay formation.

Fig. 4. This illustrates what are called *valleys of denudation;* valleys which seem to have been formed by the excavation of the superficial strata by water, leaving detached portions of the strata in insulated hills, which are styled *outliers.*

Fig. 5. A case of *parallel dip.*

Fig. 6. An instance of great contortion, as if the strata had once been *soft.*

LATE CCIX.—QUADRUPEDS.

Class Mammalia. Order Ferae. Genus Felis.

Genus Felis.

Generic character. The incisory teeth $\frac{6}{6}$; the canine teeth $\frac{1}{1}$; the grinders $\frac{4}{4}\frac{4}{4}$ or $\frac{3}{3}\frac{3}{3}$: total 28 or 30. The head is round, the jaws are short, and the tongue aculeated; the ears are in general short and triangular, and, in many species, with a white spot on the back of them; the pupils of the eyes in some are circular, in others vertically oval; the fore feet with five toes; the hind feet have four only, furnished with long, sharp, retractile claws, usually contained in sheaths.

Fig. 1. *Ocelot. Felis pardàlis,* Linn.

The ocelot is one of the most beautiful of its tribe, and is less than the leopard, its length being about three feet, exclusive of the tail, and its height about eighteen inches. The colour of its fur is gray, slightly tinged with pale fawn; the whole body and legs are covered with longitudinal chain-like stripes, broken into patches of some inches; black at the margins, and pale inside, with an open space in the centre, of the ordinary ground-colour of the fur; on the neck and head these black lines have no central opening. The colours of the female are less vivid than those of the male.

This animal is a native of South America, where it frequents the depths of the forest, living upon deer and birds. It seldom attacks man, although instances have occurred of its doing so. When hunted, and overtaken, it defends itself with great obstinacy. Its natural disposition, however, is timid and rather cowardly.

The ocelot seems less susceptible of domestication than the other members of the cat tribe. In confinement it is in a state of perpetual motion, and will not submit to the caresses of its keeper. A male and female ocelot were brought to France about twenty years ago, which had been taken when very young. At the age of three months, they became so strong and fierce, as to kill a bitch, by which they were nursed. When a live cat was thrown to them, they immediately pounced upon it, and sucked its blood, but left the flesh untouched. The male seemed to have a great superiority over the female, as he never allowed her to partake of a meal till he was satisfied.

D'Azara mentions an ocelot, which was so completely domesticated, as to be left at perfect liberty; it seemed strongly attached to its master, and never attempted to escape.

Fig. 2. *Margay. Felis Tigrina,* Linn.

The margay is about the size of the wild cat, and resembles it very much in disposition. The upper part of the body is yellowish gray, and the under parts white; four black lines pass from the vertex to the shoulders, and then change into a series of long streaks; the tail is irregularly annulated.

The margay, which has also been denominated the tiger cat and the Cayenne cat, is subject to considerable variety of colour. It is common in Brazil and Guiana, and various other parts of South America; seeming to prefer a warm to a temperate climate.

Fig. 3. *Serval. Felis Serval,* Linn.

The serval is somewhat larger than the ordinary wild cat. Its general colour is a pale fulvous yellow on the back and sides, covered with small round black spots, equally divided over the whole surface, except on the middle of the back, where they are disposed in four rows: the breast and belly are white and immaculate; its eyes are very brilliant, and have a wild and piercing look; its whiskers are very long, stiff, and nearly straight; its tail is short, spotted in some individuals, and annulated in others with black.

This species inhabits the mountainous parts of India, and is called by the natives of Malabar, the *Marapute.* It resides on trees, where it makes a bed, and breeds its young. It seldom appears on the ground, living principally on birds, squirrels, and small animals; it is extremely agile, and leaps, with great rapidity, from one branch to another. The serval never assaults man, but rather endeavours to avoid him; if, however, it is compelled to attack, it darts furiously on its antagonist, and bites and tears, like the rest of the cat kind.

Fig. 4. *Wild Cat. Felis Catus,* Linn.

Fig. 5. *Variety. Domestic Cat.*

Fig. 6. *Variety. Spanish,* or *Tortoise-shell Cat.*

Fig. 7. *Variety. Angora Cat.*

Fig. 8. *Variety. Slate-coloured or Chartreaux Cat.*

The artist has done more than usual justice to this beautiful plate, pourtraying the varieties of the cat kind.

The cat, in a state of natural wildness, and from which are supposed to have proceeded all the varieties of the domestic cat, is a native of the northern regions of Europe and Asia. In this its natural state it differs in some slight particulars from the domestic animal, having a somewhat shorter tail in proportion, a flatter and larger head, and stronger limbs; and, from an exact anatomical inspection of its interior parts, it appears that the intestines are somewhat shorter than those of the domestic cat. The colour of the wild cat is commonly a pale yellowish-gray, with dusky stripes and variegations; those on the back running lengthwise, those on the sides transversely, and with a curved direction: the tail is annulated with several alternate circles of blackish-brown and dull white: the tip of the nose and the lips are black. Even wild cats, however, appear to differ in their shades of colour in different parts of Europe. Mr. Schreber, in his plate of quadrupeds, figures a specimen of a pretty deep tawny colour, varied with black or deep-brown streaks, so that the animal has very much the appearance of a tiger, in minia-

ture; while, on another plate, he has exhibited one, communicated by Dr. Pallas, of a pale gray, with black or dark-brown variegations.

The manners of the wild cat resemble those of the lynx, and several others of this genus; living in woods, and preying on young hares, on birds, and a variety of other animals, which it seizes by surprise. It breeds in the hollows of trees, and produces about four at a birth. "The wild cat (says Mr. Pennant) may be called the British tiger; it is the fiercest and most destructive beast we have; making dreadful havoc among our poultry, lambs, and kids. It inhabits the most mountainous and woody parts of these islands, living mostly in trees, and feeding only by night. It multiplies as fast as our common cats; and often the females of the latter will quit their domestic mates, and return home pregnant by the former."

The varieties of this animal in a domestic state are very numerous; it is either entirely black; black and white; black, fulvous, and white (called the tortoise-shell or Spanish cat;) white without any variegation; fulvous and white; dun-colour or tawny, either plain or with deeper stripes; tabby, or of a similar colour to the wild cat, but with much bolder or more vivid variegations; slate-coloured or blue-gray (called the Chartreux cat;) slate-coloured with very long fur, especially on the neck and tail (the Persian cat;) white, with hair of a similar length (called the Angora cat;) and, lastly, with pencilled or tufted ears, like a Lynx, which sometimes, though rarely, takes place. Of all the above varieties, the Persian and the Angora are the most remarkable: the latter variety has sometimes one eye blue, the other yellow; a particularity which takes place in some specimens of the common white cat; it is also observable that the white variety of the cat is sometimes perfectly deaf.

To enlarge on the character and manners of this useful and agreeable domestic, would be entirely superfluous. It may be sufficient to observe, that, when well educated, the cat possesses qualities which well entitle her to the regard and protection of mankind; and if she does not exhibit the vivid and animated attachment of the dog, she is still of an affectionate and gentle disposition, and grateful to her benefactors.

She has also the merit of perpetual cleanliness, and does not soil even the nicest furniture; while her numerous and infinitely varying gesticulations, have an elegance and levity almost unequalled by any other animal..

A singular instance of attachment in the cat, is recorded in Mr. Pennant's Account of London. Henry Wriothsly, Earl of Southampton, the friend and companion of the Earl of Essex in his fatal insurrection, having been confined some time in the Tower, was surprised by a visit from his favourite cat, which, says tradition, reached its master, by descending the chimney of his apartment.

No animal, whose habits and manners we have the opportunity of accurately observing, exhibits a greater degree of maternal tenderness than the cat: the extreme assiduity with which she attends her young, and the fondness which she shows for them, afford the most pleasing entertainment to a philosophic observer. She even possesses a propensity to nurse with tenderness the young of a different individual; and it is a general observation, that a domestic cat will commonly suckle and nurse any young kitten that is newly introduced to her.

Nothing can be more beautiful than the experiment of setting a young cat, for the first time, before a looking-glass. The animal appears surprised and pleased with the resemblance, and makes several attempts at touching its new acquaintance; and, at length, finding its efforts fruitless, it looks behind the glass, and appears highly surprised at the absence of the figure: it again views itself; tries to touch with its foot; suddenly looking at intervals behind the glass: it then becomes more accurate in its observations, and begins, as it were, to make experiments, by stretching out its hand in different directions; and when it finds that these motions are answered in every respect by the figure in the glass, it seems, at length, to be convinced of the real nature of the image. The same is the case with the dog at an early age.

The cat generally lives in habits of friendship with the other domestic animals; the contrary instances arising entirely from neglect of early education.

The sleep of the cat, which is generally very light, is sometimes so profound that the animal requires to be shaken pretty briskly before it can be awakened: this particularity takes place chiefly in the depth of winter, and especially on the approach of snowy weather: at such periods also, as well as at some others, the animal diffuses a fragrant smell, something like that of cloves.

The fur of the cat, being generally clean and dry, readily yields electric sparks when rubbed; and if a clean and perfectly dry domestic cat be placed, in frosty weather, on a stool with glass feet, or insulated by any other means, and rubbed for a certain space of time, in contact with the wire of a coated vial, it will be effectually charged by this method.

Deaf Cats.—A curious fact respecting cats has lately been discovered, and is first mentioned in the English *Magazine of Natural History*. A correspondent briefly states,—"White cats with blue eyes are always deaf." Another contributor to the same work says, that, in confirmation of what is above stated, he forwards the following extraordinary fact, which came within his own observation:

"Some years ago, a white cat, of the Persian kind, (probably not a thorough-bred one,) procured from Lord Dudley's at Hindly, was kept in my family as a favourite. The animal was a female, quite white, and perfectly deaf. She produced, at various times, many litters of kittens, of which, generally, some were quite white, others more or less mottled, tabby, &c. But the extraordinary circumstance is, that of the offspring produced at one and the same birth, such as were, like the mother, entirely white, were, like her, invariably deaf, while those that had the least speck of colour on their fur, as invariably possessed the usual faculty of hearing."

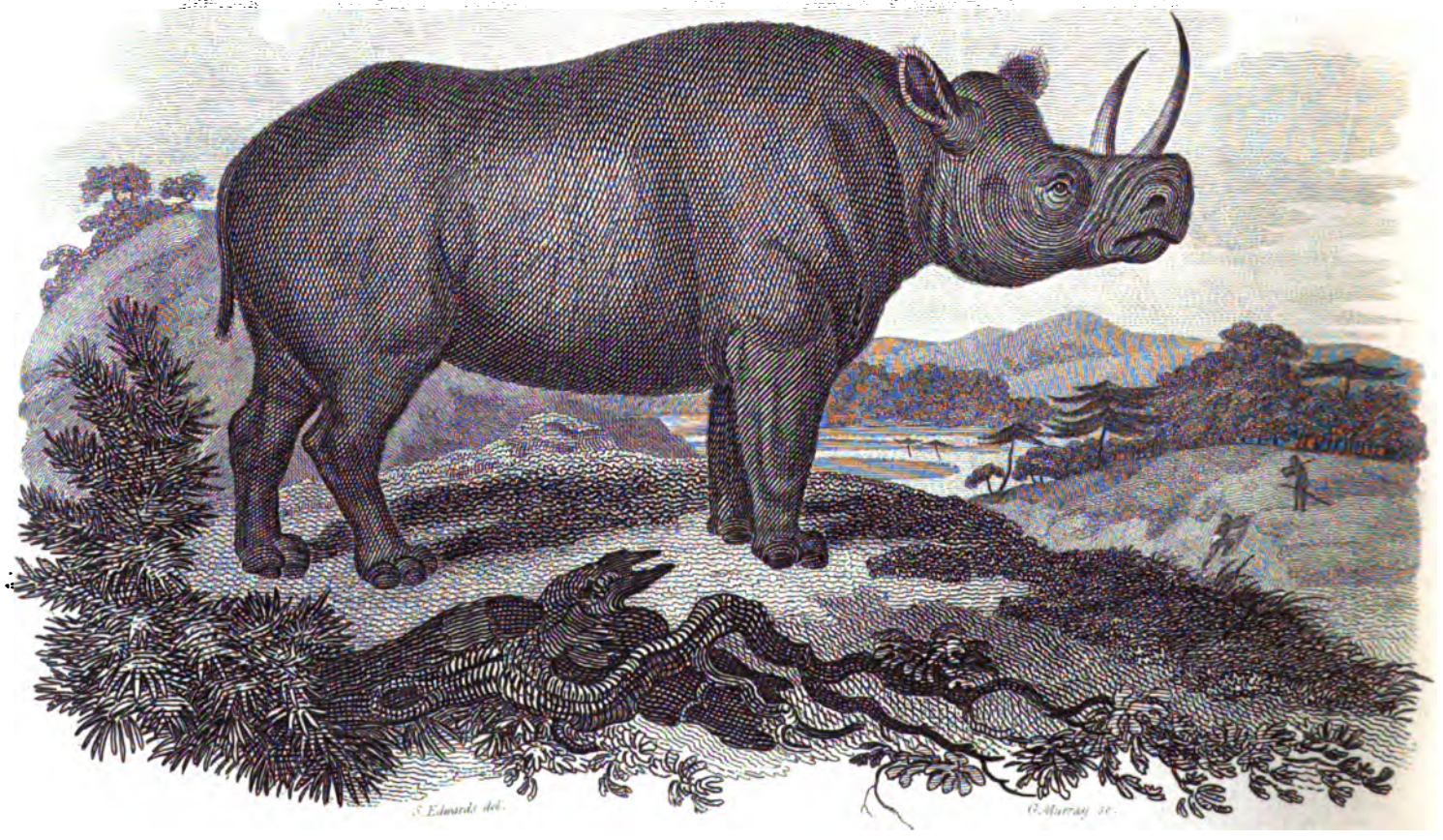
A Bell-Ringer.—A family were accustomed to feed their cat in the dining-room every day, while they were at dinner. Puss was so well acquainted with the sound of the bell, which announced that the meal was on the table, that she never failed to repair thither regularly with the family. By accident, one day, she was shut up in a room by herself, where she remained undiscovered until dinner was over. Some hours afterwards, however, she was emancipated from her confinement, when she hastened to the room, but found nothing reserved for her. Hungry and disappointed, she ran to the bell, and began fumbling it about, with the intention of ringing it; but it proved too unwieldy for her.

Concert of Cats.—Among the other inventions to amuse the people of London, which the celebrated Foote had such a knack of hitting upon, he arranged, at the conclusion of the play of "The Knights," a feigned concert of vocal music, between two cats, in burlesque of the Italian opera. The principal performer in this novel entertainment was a man well known at that time, by the appellation of Cat Harris, of whom the following anecdote is related:—

"Harris being engaged by Foote for this purpose, had attended several rehearsals, at which his mewing gave infinite satisfaction to the manager and performers. At the last rehearsal, however, Harris was missing; and, as nobody knew where he lived, Shuter was prevailed upon to try to find him out. He inquired in vain for some time, and was at length informed, that he lived in a certain court in the Minories. This information was sufficient for a man of congenial talents, like Shuter; for, the moment he entered the court, he set up a cat solo, which instantly roused his brother musician in his garret, who answered him in the same tune, and then joined Shuter in the opera."



Rhinoceros unicornis. One horned Rhinoceros.



Rhinoceros bicornis. Two horned Rhinoceros.

PLATE CCX.—QUADRUPEDS.

MAMMALIA. Order BRUTA. Genus RHINOCEROS.

Generic character. There are no incisory teeth, or they are $\frac{2}{2}$ or $\frac{1}{1}$; without canine teeth; and the grinders are $\frac{7}{7}$ or $\frac{8}{8}$; total 32 or 36. When incisory teeth exist, they are unequal among themselves; the anterior grinders are small; the posterior increasing progressively; the eyes are small, lateral, and placed far back in the head; ears long, narrow; there are three toes on all the feet, and one or two horns placed on the nose, above the nasal cavity; skin very thick, naked, and rough; the tail is short, and laterally compressed; with two teats.

FIG. 1. *One-horned Rhinoceros. Rhinoceros Unicornis*, LINN. *Rhinoceros Indicus*, DESMAREST.

This animal has one solid, conical horn on the nose, sometimes three feet in length, and eighteen inches in circumference at the root, and two incisory teeth in each jaw, with a small tooth on each side of these in the upper jaw; the skin, which is of a blackish colour, is disposed about the neck into large plaits or folds; a large fold passes from the shoulders to the fore legs, and another from the thighs; the skin is naked and rough, and covered with large tubercles, or granulations, which extend over the legs and feet. Between the great folds, under the belly, the skin is very soft, and of a rose colour.

The body of this animal is little inferior in size to the elephant, but he is much shorter in the legs; his length, from the muzzle to the tail, is nearly twelve feet, and the girth about the same measurement; and, from the shortness of its legs, the belly nearly touches the ground. The pendulous upper lip of the rhinoceros assists it in a great measure to collect its food.

The Indian rhinoceros, without being ferocious, is very intractable and rude. It is subject to paroxysms of fury, which nothing can appease. It frequents moist and marshy ground, is fond of wallowing in the mire, and seldom quits the banks of rivers. It inhabits Bengal, Siam, Java, Sumatra, Ceylon, and many places of Africa. It does not seem a numerous species, and is less diffused than the elephant. The female produces but one at a time.

The sense of smell in the rhinoceros is said to be exquisite, and hunters are in consequence always obliged to keep to the windward of him. They follow him unobserved, till he lies down to sleep, then steal close to him, and discharge their muskets into the lower part of his belly, where the skin is soft.

The rhinoceros can run with great swiftness, and, from his strength and hard impenetrable hide, he is capable of rushing through thickets with resistless fury; almost every obstacle is quickly overturned.

The first rhinoceros which was brought to England was in 1684. The next we have any distinct account of was imported from Bengal about the year 1743. Another was brought from Atchaws, in the dominions of the King of Ava, and was exhibited at Paris. He was exceedingly docile, and showed great fondness for some of his attendants. He was fed upon hay, corn, and sharp prickly plants, of which he was very fond.

The following particulars of a rhinoceros, exhibited at Exeter 'Change, was obtained by Sir Everard Home, from the person who kept him for three years, when it died; and published in the *Philosophical Transactions*. "It was so savage," says he, "that about a month after it came, it endeavoured to kill the keeper, and nearly succeeded. It ran at him with the greatest impetuosity, but, fortunately, the horn passed between his thighs, and threw the keeper on its head; the horn came against a wooden partition, into which the animal forced it to such a depth as to be unable for a minute to withdraw it, and, during this interval, the man escaped. Its skin, though apparently so hard, is only covered with small scales, of the thickness of paper, with the appearance of tortoise-shell; at the edges of these the skin itself is exceedingly sensible, either to the bite of a fly or the lash of a whip. By this discipline, the keeper got the management of it, and the animal was brought to know him; but frequently, (more especially in the middle of the night,) fits of frenzy came on; and, while these lasted, nothing could control its rage, the rhinoceros running with great swiftness round the den, playing all kinds of antics, making hideous noises, knocking every thing to pieces, disturbing the whole neighbourhood, and then, all at once, becoming quiet. While the fit was on, even the keeper durst not make his approach. The animal fell upon its knee to enable the horn to be borne upon any object. It was quick in all its motions, ate voraciously all kinds of vegetables, appearing to have no selection. They fed it on branches of willow. Three years' confinement made no alteration on its habits."

More than one of these animals have recently been brought to the United States for exhibition. It is related of one carried to England in 1790, that its voice resembled a calf's. His daily allowance of food was 28 lbs. weight of clover, besides an equal allowance of ship-biscuit, and a great quantity of greens; and he drank five pails of water every 24 hours. He liked sweet wines, and was sometimes indulged with a few bottles. He was very mild, and allowed himself to be patted on the back, even by strangers.

FIG. 2. *Two-horned Rhinoceros. Rhinoceros Bicornis*, LINN. *Rhinoceros Africanus*, DESMAREST.

The two-horned rhinoceros has no incisory teeth in either jaw, and is furnished with two erect horns on the nose, the lower one being longer than the upper. These horns are said to be moveable when the animal is in a quiescent state, and to become perfectly firm when enraged. He differs materially from the Indian rhinoceros in the appearance of his skin, which is devoid of the large folds and wrinkles of that species, having merely a slight plait across the shoulders, and some fainter wrinkles on the sides, being comparatively smooth, when opposed to the Indian species, having no hair on any part of it, except at the edge of the ears, and extremity of the tail. Mr. Burchell ascertained that musket-balls, composed of lead and tin, easily penetrated the skin of this species, though they were flattened by striking against the bones; but he is of opinion, that balls of lead alone, or, if fired with a weak charge of powder, might possibly be turned by the thickness of the hide. The flexible upper lip in this animal, like that of the former species, is of great use in collecting its food.

At first sight, this animal has much the appearance of an enormous hog, which it resembles, not merely in its general form, but also in the contour of the head, the smallness of its eyes, and size of its ears: but, in its clumsy and rudely formed feet, it is more allied to the hippopotamus and elephant.

Mr. Burchell measured an African rhinoceros, which was eleven feet two inches from the point of the nose to the insertion of the tail, following the undulations, but, in a straight line, was only nine feet three inches; the tail, which was flattened vertically at its extremity, was twenty inches; and the greatest girth of the body was eight feet four inches.

The organs of smell, and other senses in this species, strongly resemble that of the Indian rhinoceros, and its habits are so nearly allied, that a repetition of them is unnecessary.

Rhinoceros Hunt.—Some years ago, a party of Europeans, with their native attendants and elephants, met with a small herd of seven of them. These were led by a larger and more powerful animal than the rest. When this large leader charged the hunters, the first elephants, in place of using their tusks as weapons, which they are generally in the practice of doing, wheeled round, and received the blow of the rhinoceros's horn on their hind quarters; and, so powerful was the concussion, that it brought them instantly to the ground, with their riders, and as soon as they could get on their feet again, the brute was ready to repeat the attack, and was certain to produce another fall; and in this manner did the contest continue, until four of the seven were killed, when the rest made good their retreat.

PLATE CCXI.—ORNITHOLOGY.

Order PICAE. Genus TROGON. Genus BUCCO. Genus YUNX. Genus PICUS. Genus SITTA.

Genus TROGON. CURUCUI.

The birds of this genus are mostly inhabitants of South America, there being only two that are found in other parts; they differ very much in appearance in the various stages of growth, so much so, that it has caused great confusion of species: they feed on fruits, and all agree in their general habits of life, which are similar to those described under T. curucui. They are called *Couroucouis* or *Curucui* at Guiana, from their notes being very much like that word.

FIG. 1. *Red-bellied Curucui. Trogon Curucui*, LINN. and CUV.

Rather less than a Magpie; length ten inches and a half; beak pale yellow; the under mandible armed with stiff black bristles, and both eye-lids the same.

This bird is said to vary very much, and Marcgrave mentions one which had the wing-coverts plain brown: the bill ash-coloured, irides saffron-coloured, and without the bare spot under the eye mentioned by Brisson in his description.

This is a very solitary bird, being found only in the thickest forests, and in the pairing time there are never more than two found together, at which time the male has a very melancholy note (by which his haunts are discovered) which is never uttered at any other time than while the female is sitting, for instantly on the young making their appearance, he becomes again perfectly mute. They begin to pair in April, and build in the hole of a rotten tree, laying three or four white eggs, about the size of a pigeon's, on the decayed dust, which if there does not happen to be any already in the hole, they are said to procure by bruising the sound wood into powder, by means of their bill, which being very strong and powerful they easily effect. During the incubation of the female, the male supplies her with food, and by his song helps to pass away the time, which might otherwise seem too long. The young, when first hatched, are quite destitute of feathers: the head is very large and out of proportion, and the legs too long: the old birds feed them with small worms, caterpillars and insects; and when able to shift for themselves, desert them and return to their solitary haunts, till August or September; when they are again instinctively prompted to produce another brood.

These birds are called at *St. Domingo*, *Le Caleçon rouge*, and in other islands, *Demoiselle*, or *Dame Angloise*, in which places it has been tried in vain to tame them, as they refuse to eat, and die in consequence. They are likewise found in Cayenne, Peru, Brazil, and Mexico.

Genus BUCCO. BARBET.

The birds of this genus are all inhabitants of Africa, and the warmer parts of Asia and America; their head is very large, their bills strong and nearly straight, almost covered with bristles, tail-feathers generally ten. They are a solitary stupid race, mostly living in sequestered forests; their principal food is insects.

FIG. 2. *Latham's Barbet. Bucco Lathami.*

Length six inches: beak pale, covered with bristles at the base, which are longer than the bill itself: the forehead, chin, and sides of the head, round the eyes are of a dull buff colour: the rest of the head and body are of a dark olive green, except the under parts, that are rather lighter: wings the same as the back: quills dusky, with green margins; the tail likewise dusky and short: legs and claws yellow.

There is a specimen of this bird in the British Museum, native place unknown.

FIG. 3. *Black Spotted Barbet. Bucco Cayenensis. Var.*

This is a variety of the Cayenne Barbet, inhabiting Cayenne, Guiana, and St. Domingo.

Genus YUNX. WRYNECK.

This genus, which consists of only a single species, has, by most authors, been held distinct: it seems to be the link between the Woodpeckers and the Cuckows; as it has the tongue and feet of the former, but it cannot be placed there on account of the weakness of its beak; while it is removed from the latter (where it was originally placed by Linneus,) by its long tongue, although it has a great affinity in other respects. There are ten feathers in the tail.

FIG. 4. *Common Wryneck. Yunx Torquilla.*

The length of this beautiful bird is about seven inches; the beak is three quarters of an inch long, nearly straight, and sharp pointed; tongue cylindric, two inches and a quarter in length.

The name *Wryneck* seems to have been given to this bird from its singular manner of turning its head over its shoulder alternately, when the black mark on the back of the neck gives it a twisted appearance; it also erects all the feathers on the top of the head: its beak seems to be of very little use in procuring subsistence, the tongue being the chief instrument used for that purpose.

If this bird be surprised in its nest, it has a singular action of defence: stretching itself at full length, and erecting the feathers of the head, it suddenly rises, making at the same time a hissing noise like a snake; which has often been the means of the nest not being plundered of the young, from the supposition that they were advancing their hands on a brood of that reptile.

It is found throughout Europe and most parts of the old continent: it is known by the names of Long-tongue, and Emmet-hunter.

Genus PICUS. WOODPECKER.

The birds of this genus climb trees, particularly those that are decaying or dead, in search of the insects and larvæ which destroy the tree within, and which are their natural food: they are unjustly persecuted in many places, on a supposition that they are injurious to the trees, when in fact they do good, by destroying those insects which would otherwise increase so much as to cause the trees' overthrow in a short time. Their beak is large, strong, and well fitted for its employment, being terminated in a sort of wedge, by which it is enabled to pierce the bark of trees, and bore into the solid wood. Its neck is short and thick, and being furnished with very powerful muscles, it is capable of striking with such force against the trunks of trees, as to be heard at a great distance: its tongue is long and taper, with a hard bony substance at the tip, which terminates in two long slender cartilages proceeding from below upwards, and from behind forwards, over the whole skull, under the skin, and are attached to the forehead near the base of the beak: by means of these cartilages it is that the birds of this genus are able to thrust out their long filiform tongue to obtain the insects or their larvæ, which are often deeply seated in the solid tree: their tail consists of ten stiff sharp-pointed feathers, bent inwards, by which they secure themselves on the trunks of trees when in search of food. Their feet are well adapted for climbing, as the toes are situated two and two, by which they can creep up or down in any direction. They have a membranaceous stomach, and want the cæcum, a circumstance peculiar to this tribe.

The apparent solitary life of the Woodpecker is thus described by Buffon. "Of all the birds which earn their subsistence by spoil, none leads a life so laborious and painful as the Woodpecker: Nature has condemned it to incessant toil and slavery. While others freely employ their courage or address, and either

ORNITHOLOGY.

*Div.ⁿ 1.ˢᵗ Land Birds*_Order 2.ᵈ PICÆ.

PLATE. 211.

Linn Syst.



Genus *TROGON.*	*G. BUCCO.*	*G. YUNX.*	*G. PICUS.*	*G. SITTA.*
(Curucui)	(Barbet)	(Wryneck)	(Woodpecker)	(Nuthatch)
1 T. *Curucui*	2.B. *Lathami* - A.B. *Cayanensis var.*	4.Y. *Torquilla.*	5.P. *Pileatus* - 6.P. *Carolinus var.*	7.S. *Europæa.*
RED BELLIED C.	*BLACK SPOTTED B.*	*COMMON WRYNECK.*	*PILEATED W. CAROLINA W. Var.*	



P. *Gallus* 1. Wild Cock. 3. Rumpless Cock. 5. Hamburgh Cock. 7. Game Cock. 9. Bantam Cock. } *Varieties.*
2. Hen. 4. Silky Cock. 6. Hen. 8. Hen. 10. Hen. }

shoot on rapid wing or lurk in close ambush, the Woodpecker is constrained to drag out an insipid existence in boring the bark and hard fibres of trees to extract its humble prey. Necessity never suffers any intermission of its labours, never grants an interval of sound repose; often during the night it sleeps in the same painful posture as in the fatigues of the day. It never shares the sports of the other inhabitants of the air, it joins not their vocal concerts, and its wild cries and saddening tones, while they disturb the silence of the forest, express constraint and effort: its movements are quick, its gestures full of inquietude, its looks coarse and vulgar; it shuns all society, even that of its own kind; and when it is prompted to seek a companion, its appetite is not softened by delicacy of feeling."

Fig. 5. *Pileated Woodpecker. Picus Pileatus.*

This bird is in length fifteen inches: beak two inches long, and of a lead-colour; irides golden: top of the head crowned with long red feathers; beneath which, over the eye, there is a streak of white, and below this a broad black one, in which the eyes are placed: on each side of the jaw there is a stripe of red reaching the whole length of the mandible, and part of the way down the neck: cheeks, throat, front, and sides of the neck pale buff; having a band of black arising at the corners of the mouth, and passing through the middle down the sides of the neck: hind part of the neck, back, and rump black: belly, sides, thighs, breast, and under tail-coverts blackish: wings spotted with white, and a similar coloured spot on the back: the two middle tail-feathers longest: legs and claws black: female differs in having the forehead brown, and wanting the red stripe on the lower mandible. This species is subject to trifling variations in its markings, being sometimes found striated with white beneath. It is said to be very injurious to maize, not that it eats any part of the plant, but it settles on the ripe ears to pick off the insects that abound there: it is very common in many parts of North America, where it is called *May May*.

Fig. 6. *Carolina Woodpecker. Var. Picus Carolinus. Var.*

A variety of, and very similar to, the Carolina Woodpecker, common in the woods of Carolina and Jamaica.

Genus Sitta. Nuthatch.

In this genus, as in that of Alcedo, only one European species is hitherto known to exist. In their general manners the Nuthatches resemble the Woodpeckers, chiefly frequenting trees, in the cavities of which they breed, and feeding on nuts, insects, berries, &c.

Fig. 7. *European Nuthatch. Sitta Europea*, Linn.

This bird is very correctly described by Mr. Pennant in the British Zoology. "The Nuthatch weighs near an ounce: its length is near five inches three quarters; breadth nine inches: the bill is strong and straight, about three quarters of an inch long; the upper mandible black, the lower white: the irides hazel; the crown of the head, back, and coverts of the wings are of a fine bluish gray: a black stroke passes over the eye from the mouth: the cheeks and chin are white; the breast and belly are of a dull orange-colour; the quill-feathers dusky: the wings underneath are marked with two spots, one white, at the root of the exterior quills, the other black, at the joint of the bastard wing: the tail consists of twelve feathers; the two middle are gray; the two exterior feathers tipped with gray; then succeeds a transverse white spot; beneath that the rest is black: the legs are of a pale yellow; the back toe very strong, and the claws large." "This bird," adds Mr. Pennant, "runs up and down the bodies of trees, like the Woodpecker tribe; and feeds not only on insects but on nuts, of which it lays up a considerable provision in the hollows of trees. *It is a pretty sight*, says Mr. Willughby, *to see her fetch a nut out of her hoard, place it fast in a chink, and then standing above it with its head downwards, striking it with all its force, breaks the shell, and catches up the kernel.* It breeds in the hollows of trees; if the entrance to its nest be too large, it stops up part of it with clay, leaving only room enough for admission; in autumn it begins to make a chattering noise, being silent for the greatest part of the year. Dr. Plott tells us, that this bird, by putting its bill into a crack in the bough of a tree, can make such a violent sound as if it was rending asunder, so that the noise may be heard at least twelve-score yards."

PLATE CCXII.—ORNITHOLOGY.

Order Gallinæ. Genus Phasianus. Pheasant.

This genus embraces some of the most beautiful birds in existence, which, as far as known, possess the same manners of life: they are all natives of Asia, frequenting woody places: the females produce many young ones at a brood, which they foster for some time like the domestic hen: their nests, which are rude, are formed on the ground: their food consists of seeds and insects: the young, when first hatched, are clothed with a soft down.

Fig. 1, 2. *Wild* or *Jungle Cock and Hen. Gallus sonnerati*, Linn.

This magnificent bird is a native of India, and has been thought to be the origin of our domestic poultry; but as there are no facts that support the conjecture, it must be considered a distinct species, differing materially from the cultivated one.

It has a dentated comb on the head, and the sides of the lower mandible of the beak are adorned with wattles resembling those of G. domesticus: the naked space round the eyes and on the throat is larger than in that bird. The female is less than the male, and has scarcely any comb or wattles: the throat is covered with feathers, which is not the case with the common hen, which has that part nearly naked: the whole of the plumage of the under parts of the body resembles that of the male, except that the colours are less brilliant.

Inhabits large forests in India, where it occurs in great profusion.

Fig. 3. *Rumpless Cock. Gallus ecaudatus*, Linn.

This most singular species is distinguished by not having even the rudiments of a tail or rump: its head is adorned with an entire comb: the cheeks, from behind the ears to the throat, are naked: from the base of the lower mandible depend two red fleshy wattles, as in the common Cock.

Inhabits the island of Ceylon, among the immense forests of that country: its nest is placed upon the ground, and is coarsely made of slender plants, and similar to that of the Partridge: the bird is very wild: the cry of the cock is less sonorous than in the domestic species.

The domesticated kind of this is very common in some parts, and varies exceedingly in its plumage, but all are destitute of the tail and rump: in some the comb is dentated, and in a few double, but it does not appear that any have that part smooth.

Fig. 4. *Silky Cock. Gallus lanatus*, Linn.

Another singular species of this genus comes next: this is distinguished from all others in having the body covered with feathers, with their webs entirely disunited, and resembling hair or silk: it is entirely white, with the exception of the comb and wattles, which are of a red-blue: the legs are reddish violet, and very strong: the beak is of a clear blue: the irides are red, surrounded by a slight circle of black: as in the last species, this has the whole of the skin and periosteum black, but its flesh is remarkably white, and most exquisite in flavour, exceeding the common poultry in both respects. These birds inhabit dif-

ferent parts of Asia, particularly Japan and China; the inhabitants of which latter place carry about cages full of them, and sell them to the Europeans.

Fig. 5, 6. *Hamburgh Cock and Hen.* Much resembling the domestic breed.

Fig. 7, 8. *Game Cock and Hen.* A variety of the same.

Fig. 9, 10. Ditto.

PLATE CCXIII.—ICHTHYOLOGY.

The genus Gastrobranchus was formed by M. Blainville for the reception of those fishes of the Linnean genus Myxine, in which the intervals of the branchiæ, instead of having separate issues, communicate with a common canal on each side, each of which terminates in a distinct hole situated under the heart.

Fig. 1. *Gastrobranchus cæcus*, Bl. Cuv. *Myxine glutinosa*, Linn. Glutinous Hag.

This fish is rounded, and much resembles a Lamprey. It has no perceptible eyes; the mouth is circular and surrounded by cirri; the tongue acts like a piston, and the vertebral column is like a cord. It inhabits the Arctic Ocean.

The genus Hepatremus chiefly differs from the preceding by having seven holes on each side, as in the true Lampreys.

Fig. 2. *Hepatremus Dombeyi*, Dumer and Cuv. *Gastrobranchus Dombeyi*, Lac. It inhabits the South Seas.

The genus Petromyzon is marked by a head somewhat slenderer than the body; the mouth is larger above than beneath; the teeth are orange-coloured, hollow within, and surrounded by a fleshy margin. It has neither pectoral nor ventral fins, and has seven spiracles on each side of the neck.

Fig. 3. *Petromyzon marinus*, Linn. and Cuv. True Lamprey. *Muræna* of the Romans.

The mouth is papillous within, and the second dorsal fin is distinct from the tail: its colour is a dull olive, with yellowish white marks or variations. The mouth is large, oval, situated beneath, and paved as it were with several rows of sharp, triangular teeth.

Although an inhabitant of the ocean, this fish ascends rivers, and is commonly observed attached by its mouth to rocks or logs, while its body hangs in the direction of the current. The Lamprey has always been much prized as an article of food. The Romans held it in extravagant estimation, had ponds for rearing them, and in some instances fed them on their superannuated slaves.

Fig. 4. *Petromyzon fluviatilis*, Cuv. Lesser Lamprey.

The second dorsal fin is angulate: the head greenish, with a row of larger teeth behind the smaller ones. It inhabits the seas of Europe. Vast numbers are used by the Dutch in the cod and turbot fishery.

Fig. 5. *Petromyzon fluviatilis, Junior.* Is found with the preceding species.

PLATE CCXIV.—ENTOMOLOGY.

Order Coleoptera.

The genus Meloe, or Blossom-eater, has the antennæ moniliform, thorax roundish, head inflected and gibbous, shells soft and flexile.

Fig. 3. *Meloë proscarabeus*, Linn. and Lat.

Fig. 4. *Meloë variegatus*, Linn. and Lat.

Some of the preceding species, when applied for a considerable time to the skin, produce a watery blister.

The genus Lytta has also filiform antennæ; it has four unequal feelers, the hind ones being clavate; thorax roundish; head inflected, gibbous; shells soft, flexile, as long as the abdomen.

Fig. 1. *Lytta vesicatoria*, Linn. and Lat.

This species is of a beautiful green colour, and is familiar to every one as the *blistering fly* of the materia medica. It comes from Spain.

Fig. 2. *Lytta dubia*, Linn. and Lat..

The genus Mordella is characterized by moniliform antennæ; head deflected and bent under the neck; shells curved downwards towards the tip; at the base of the abdomen, and before the thighs, is a broad lamina.

Fig. 5. *Mordella bicolor*, Linn. and Lat.

Fig. 6. *Mordella flava*, Linn. and Lat.

Fig. 7. *Mordella dorsalis*, Linn. and Lat.

Fig. 8. *Mordella frontalis*, Linn. and Lat.

The genus Mylabris is closely allied to the preceding, and was separated from Meloe by Olivier. The respective length of the antennæ varies slightly, and these modifications have an influence on the form of the joints.

Fig. 9. *Mylabris cichorei*, Linn. and Lat.

Length from six to seven lines; black, pilose; a roundish yellow spot on the base of each elytron, and two indented, transverse bands of the same colour: antennæ constantly black.

It is common in southern Europe, and its vesicating qualities are as active as those of Cantharides.

Fig. 10, 11. Varieties of the same species.

In the genus Staphylinus, the antennæ are moniliform, feelers four, shell half as long as the body, wings folded under the shells, tail furnished with two vesicles.

Fig. 12. *Staphylinus hirtus*, Linn. and Lat.

The genus Forficula has setaceous antennæ; feelers unequal and filiform; wing-cases half as long as the abdomen; wings folded under wing-cases; tail armed with forceps.

Fig. 13. *Forficula gigantea*, Linn. and Lat.

Fig. 14. *Forficula gigantea. Variety.*

The genus Cercoma is closely allied to Mylabris, and was considered by Linnæus a Meloe. They abound on chamomile flowers, in the south of Europe.

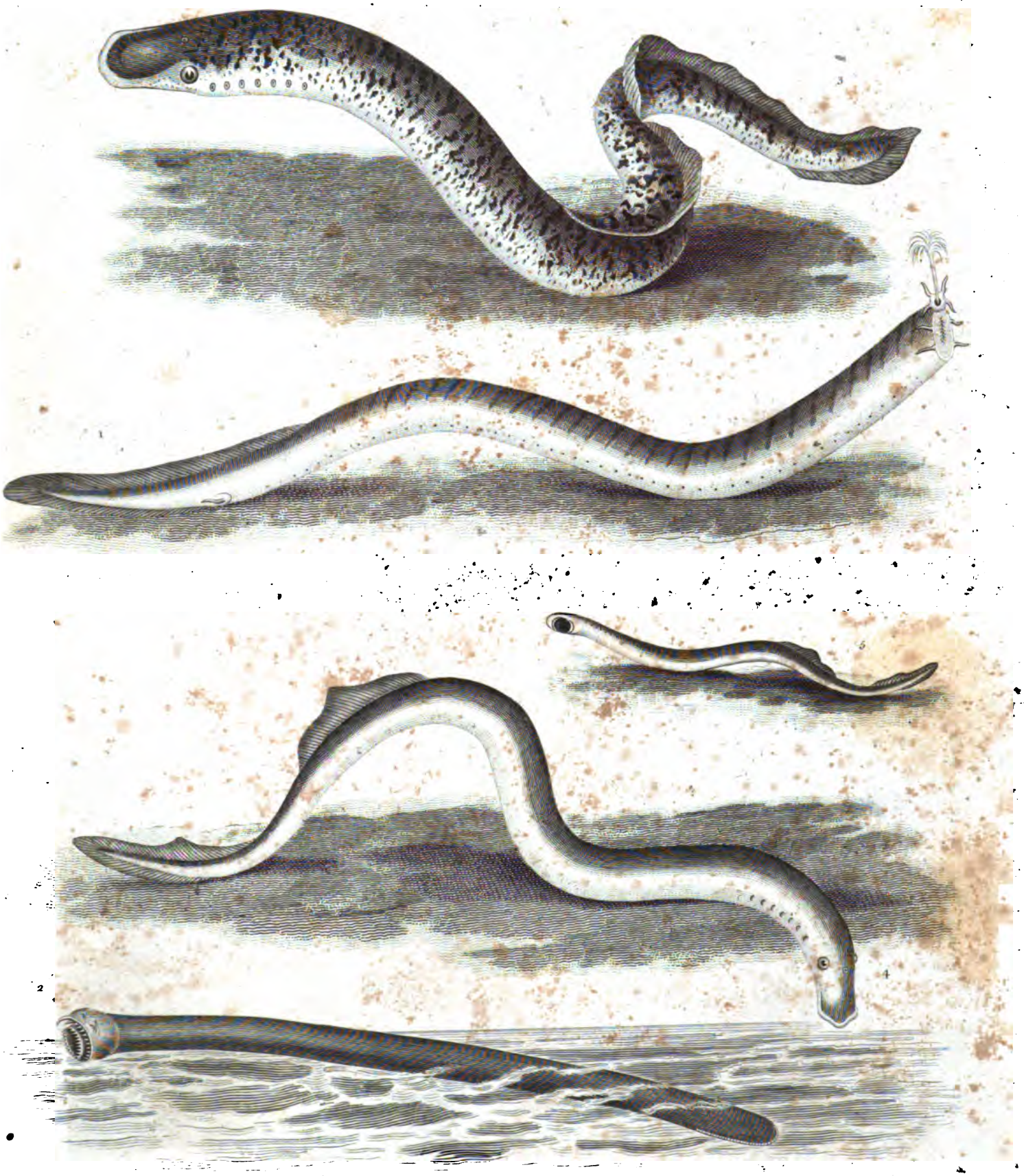
Fig. 15. *Cercoma Schafferi*, Lat. *Meloë Schafferi*, Linn.

PLATE CCXV.—CONCHOLOGY.

In the genus Arca, the valves are equal and transverse, that is to say, the hinge occupies the longest side. It is furnished with a great number of small teeth, arranged in a rectilinear manner. The valves do not close perfectly in the centre, because there is a horny plate, or tendinous fillet, before the abdomen of the animal, which serves for a foot, and by means of which it can adhere to other bodies. They are usually covered by a hairy epidermis, and inhabit deep water, though often cast on the shore by storms.

Fig. 1, 2. *Arca tortuosa*, Linn. and Lam.

The beak is not central in this species, and the shell has a singularly twisted or tortuous shape. It is delicately ribbed, and expanded at one end. It inhabits the Indian Ocean.

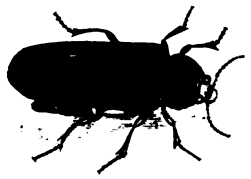


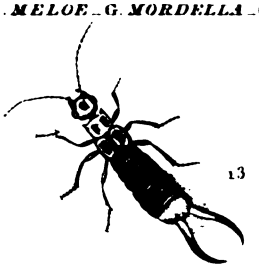
G. GASTROBRANCHUS — GENUS PETROMYZON.

1 G. Cæcus — 2 G. Dombeyi — 3 P. marinus — 4 P. fluviatilis — 5 P. fluviatilis Jun.

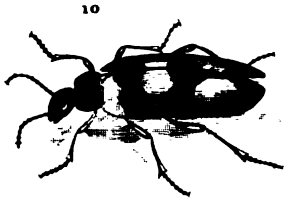
Hag-Fish — Dombey an H.F. — Marine Lamprey — River Lamp[rey] — under surface

Linn.Syst. G. LYTTA . G. MELOE . G. MORDELLA . G. MYLABRIS . G. STAPHYLINUS . G. FORFICULA.

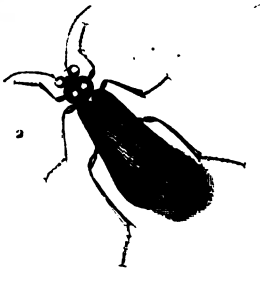
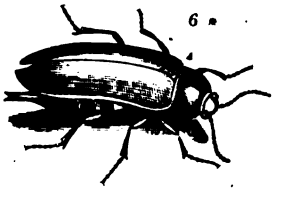
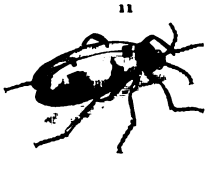
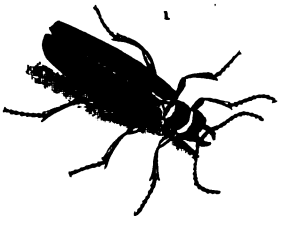
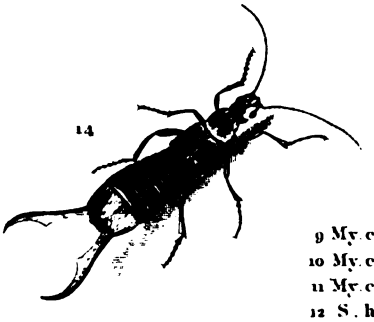
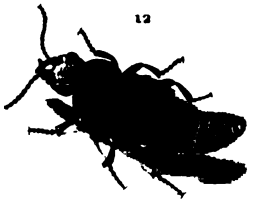








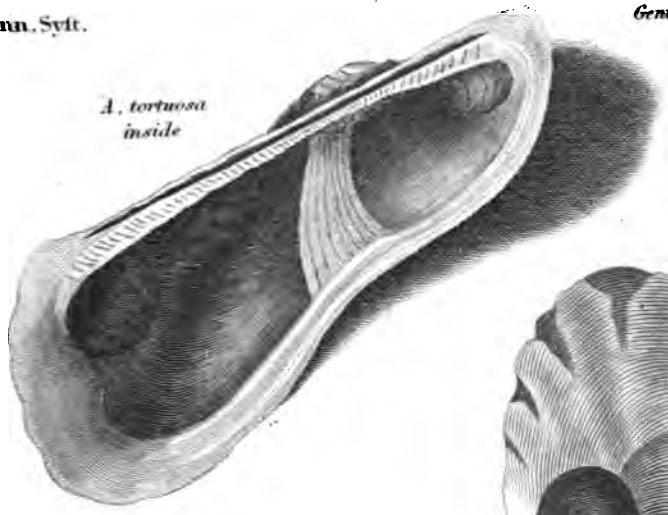




1 L. vesicatoria
2 L. dubia
3 Me. proscarabæus
4 Me. variegatus
5 Mo. bicolor
6 Mo. flava
7 Mo. dorsalis
8 Mo. frontalis

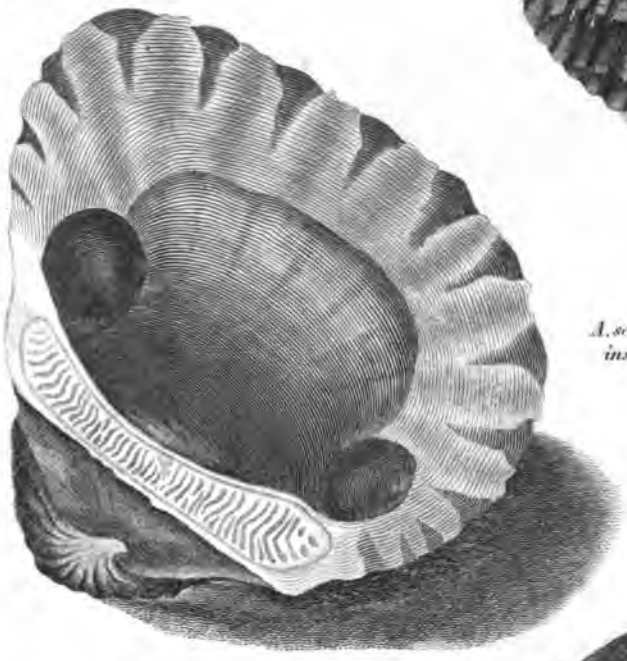
9 My. cichorei *var.*
10 My. cichorei *var.*
11 My. cichorei *var.*
12 S. hirtus
13 F. gigantea
14 F. gigantea
15 L. schafferi
* *magnified*



A. tortuosa inside



A. nebulosa



A. senilis inside

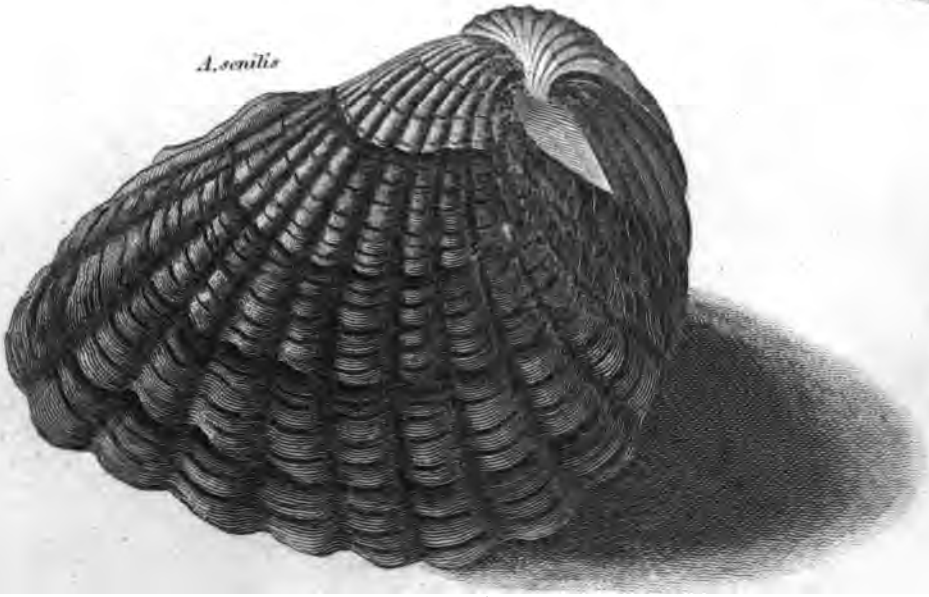
A. nodulosa inside





A. tortuosa

A. senilis





A. nodulosa



VERMES.

Order Zoophytes.

GENUS *FLUSTRA.*



1 Flustra foliacea
2 F.....bombycina
3 F.....carbasea
4 F.....verticillata

* *magnified*

MINERALOGY.

MINING.

Fig. 1.

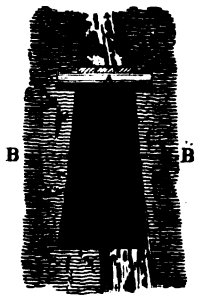


Fig. 2.

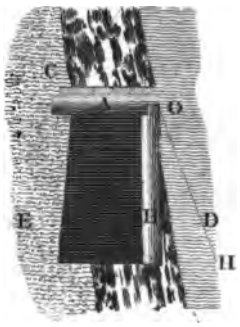


Fig. 3.



Fig. 4.

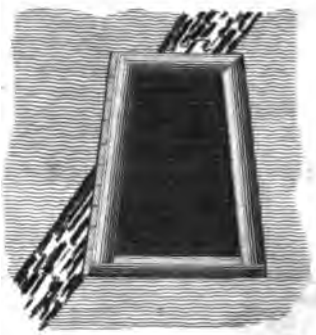


Fig. 5.

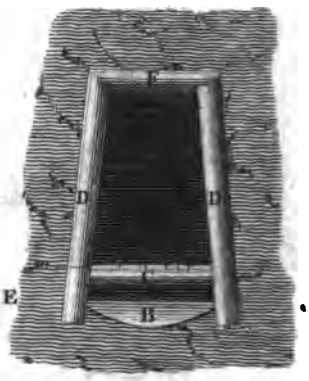


Fig. 8.

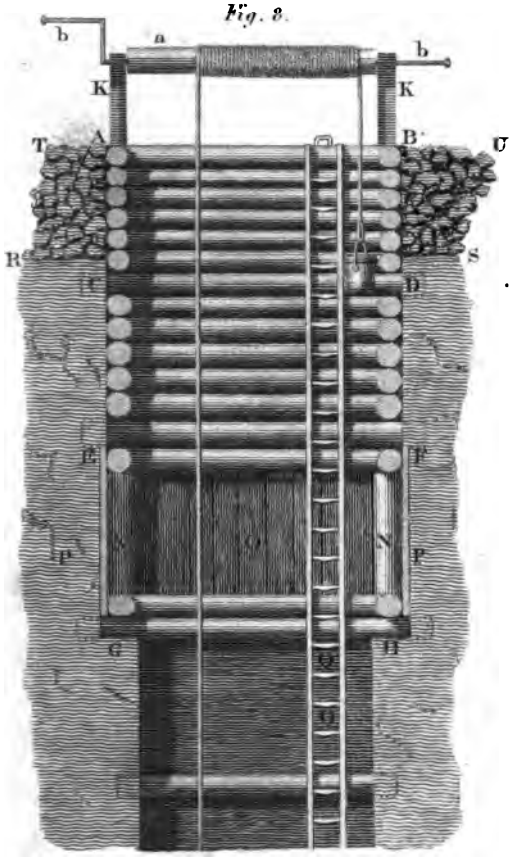


Fig. 7.

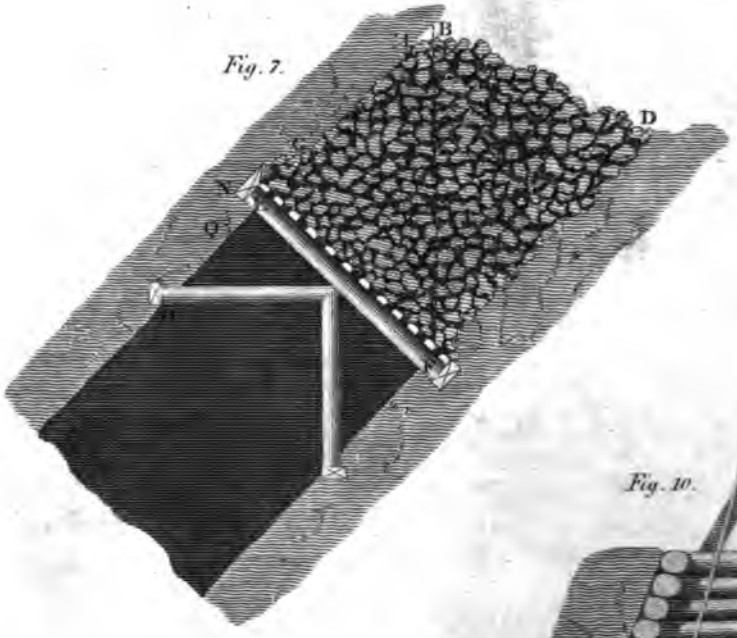


Fig. 10.

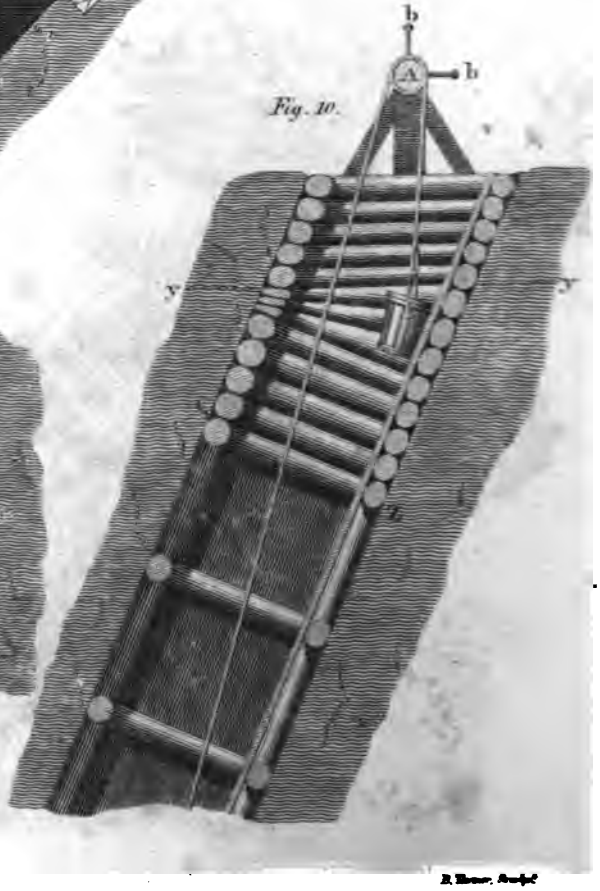


Fig. 6.



Fig. 9.

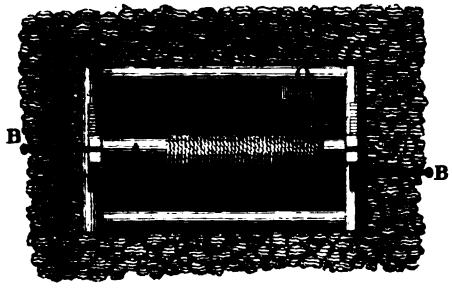


Plate 218.

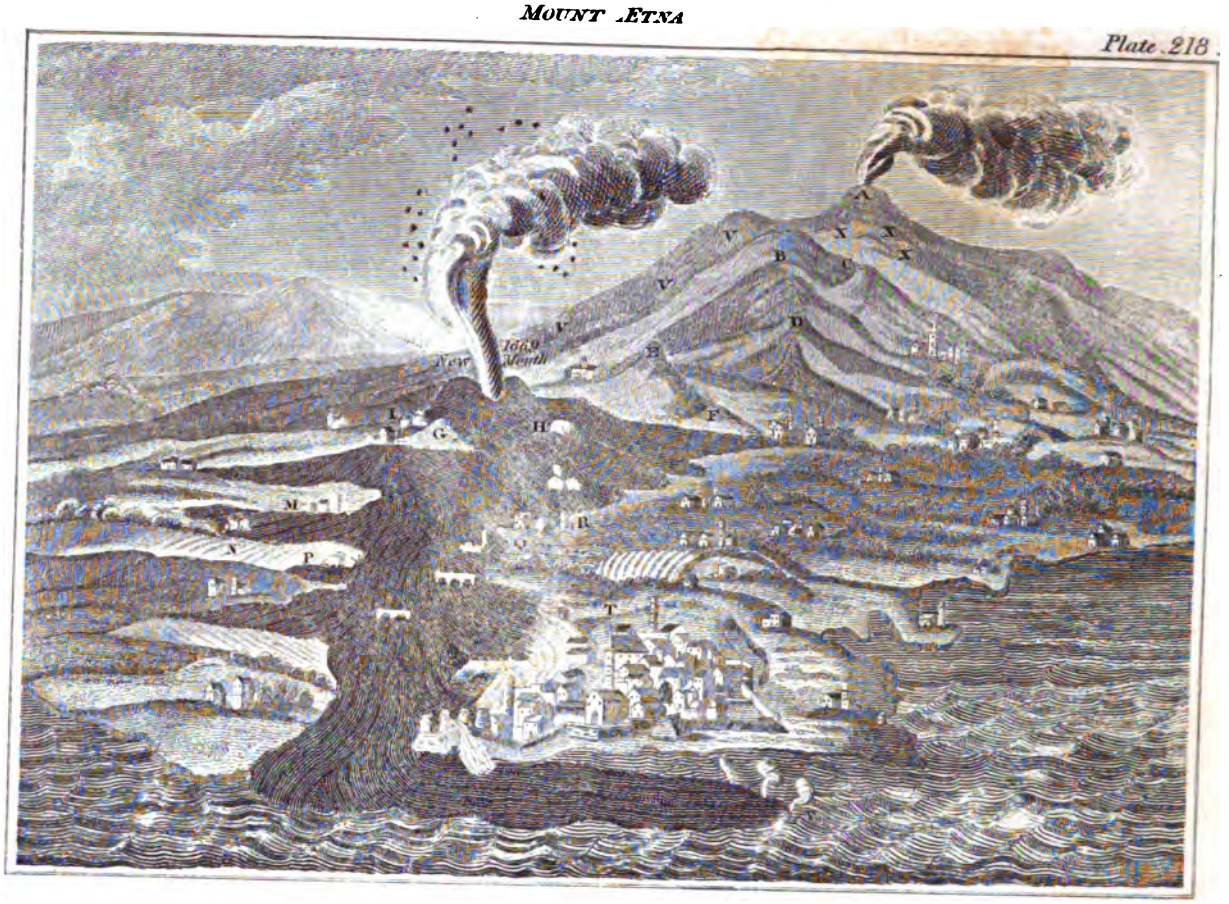


Plate II.



Published by Saml. C. Atkinson

GM.



MAMMALIA. ORDER FERÆ. GENUS TALPA. MOLE. GENUS SOREX. SHREW. GENUS ERINACEUS. HEDGE-HOG.



1. T. Capensis. Cape M.—2. T. Longicaudata. Long-tailed M.—3. T. Europea. Common M.—4 Sorex Minutus. Minute S.—5. S. Moschatus. Musky S.
6. S. Araneus. Foetid S.—7. E. Europæus. Common H.—8. E. Ecaudatus. Madagascar H.

Fig. 3, 4. *Arca senilis*, Linn. and Lam.

A ponderous shell, with ten or twelve large, convex ribs. It inhabits the Pacific Ocean.

Fig. 5, 6. *Arca nodulosa*, Linn. and Lam.

A rounded or ventricose shell, with about twenty ribs, which present equidistant, beaded protuberances. Inhabits the Indian Ocean.

In the genus Pectunculus, the hinge forms a curved line, and the shell is lenticular: the valves close completely, and their summits are approximated.

Fig. 7. *Pectunculus nodulosus*, Lam. *Arca nodulosa*, Linn.

With more than twenty squamous ribs, mottled with brown and white.

PLATE CCXVI.—ZOOPHYTES.

The genus Flustra of Linnæus embraces those animal structures which have a great number of cells united like honeycombs, sometimes covering various bodies, and sometimes forming themselves into the appearance of stems or leaves, of which, in certain species, one side only is furnished with cells; while, in others, both have that arrangement. Their substance is more or less horny.

Fig. 1. *Flustra foliacea*, Linn. and Cuv.

Fig. 2, 2*. *Flustra bombycina*, Linn. and Cuv. The larger figure being greatly magnified, to show the cells.

Fig. 3, 3*. *Flustra carbasea.*

In the closely allied genus Electra, each articulation is composed of several cells arranged in a ring.

Fig. 4, 4*. *Electra verticellata*, Cuv. *Flustra verticellata*, Linn.

PLATE CCXVII.—MINERALOGY—MINING.

This plate illustrates the method of propping or timbering the shafts, galleries, and other perforations of mines. The cases here explained apply rather to metallic veins than coal-seams, unless, indeed, where these are highly inclined or nearly vertical.

Fig. 1. The plan of supporting the materials of the vein by letting in the cross timbers A into the solid rock B B. The rock upon the sides is supposed to be hard enough to sustain itself.

Fig. 2. Here the top is supported partly in the same manner, the logs A being inserted into the rock, where it is hard, on the side C E, and sustained on the other side, where the rock is less firm, by the post B,—each being notched at O, to prevent slipping.

Fig. 3. The mode of propping the roof, walls, and floor of the galleries, where the loose nature of the rock requires it. Planks are put outside of the logs, to keep out the smaller fragments.

Fig. 4. Here the logs are put together nearly in the same manner, the planks being placed, however, only on the side next the vein, as the place where tightness is most needed.

Fig. 5. A mode of timbering, to admit a drain B beneath the floor, for the escape of the water of the mine.

Fig. 6. This is a vertical vein, the rock on the sides requiring no propping. The floor-timbers C rest on the vein. The roof-timbers A are let into the side rock, and also supported in the centre, for greater strength, by the braces B B. This is particularly used where the gallery is large.

Fig. 7. A mode of sustaining the rubbish in the parts of a vein already worked, where the vein is inclined, and the side rock sufficiently compact.

Fig. 8. The method of securing the upper part of a shaft or pit against the caving in of the looser rock and soil near the surface. In this case, no timbering is supposed necessary for the lower portions, which lie in a more compact part of the rock.

Fig. 9. A ground plan of the mouth of the shaft. Q, the ladder; A, the windlass.

Fig. 10. A method of bracing the upper part of a shaft where it is inclined. The lower side of the shaft is laid with plank, to give more smoothness to the motion of the bucket.

PLATE CCXVIII.—GEOLOGY.

Mount Ætna.—Fig. 1. This view represents Mount Ætna, as seen from the sea near Catanea, on the side by which it is usually ascended.

The town, T, on the coast, is Catanea, so often threatened by the currents of lava from the mountains. The journey to the summit from this place is about thirty miles long, the traveller passing through three different climates before he reaches the top. The mountain is divided into three zones or regions. The first or lowest is called the fertile region, and has a width of from twelve to eighteen miles. The first station in the ascent of the mountain is Nicolosi, (see H,) which is about twelve miles up the mountain, and 2496 feet above the sea. Not far from Nicolosi is Monte Rosso,—once a plain, but thrown up by a dreadful eruption in 1669, discharging a torrent of lava, which committed great ravages, and entered the sea in a kind of promontory. (See V.)

The edifice above the crater of Monte Rosso is one of the resting-places for travellers visiting Ætna. It was formerly inhabited by some Benedictine monks, and is called St. Nicolo dell' Arena.

At a small distance there is another mountain called Montpileri, (see G). It has a large crater, and was formed by the first eruption, which destroyed the celebrated Hybla, so noted for its fertility and its honey.

About three miles above St. Nicolo dell' Arena, commences the middle or woody region, the temperate zone of the mountain. This is from eight to ten miles broad, covered with a dense forest of oaks, beeches, firs, and pines. The east side abounds in chestnut-trees of enormous size,—one, the celebrated *Castagno di centi cavallo*, being capable, it is said, of sheltering a hundred horses; and hence its name.

Extending not far from Monte Rosso, almost to the highest crater, there is a vast and profound cleft in the mountain, (see V V V). This is called the Val del Bove.

The summit of Ætna is clad in eternal snow and ice, which extend downwards, along its slopes, a distance of eight to twelve miles, marking a region of extreme sterility, called the frigid zone.

Fig. 2. Exhibits the summit of the high crater of Ætna, as it appeared in 1787. A A A, the edge of the lava stream of that year. B B, the circumference of the crater, with its cleft C C, through which the interior was then discernible. D, the flat floor of the crater, sometimes covered with melted lava,—having the aperture in its centre, through which the column of vapour, F, ascends. G G is a portion of the wall of the crater, from which the interior is best seen. H H is another column of smoke, issuing from crevices in the bottom of the crater.

PLATE CCXIX.—QUADRUPEDS.

Mammalia. Order Ferae. Genus Talpa. Genus Sorex. Genus Erinaceus.

Genus Talpa. Mole

Generic character. Incisory teeth, $\frac{8}{8}$; small, placed vertically in the upper jaw, forming an arch, and a little inclining

in the lower; canine teeth $\frac{1}{1}$, triangular; cheek teeth $\frac{7}{6}$; the three anterior in the upper, and the two in the lower jaw, smaller than the rest; head elongated; eyes extremely small; no external ears; pentadactylous; fore feet very large, turned, with the lower edge trenchant; toes united to the nails, which are strong, and slightly arched; hinder feet weak.

FIG. 1. *Cape Mole. Talpa Capensis*, LINN. *Chrysocloris Capensis*, CUV.

This is rather smaller than the common Mole, and of the same general form, but has a short snout, and is destitute of a tail. The fore feet are formed like those of the *red mole*, having only three claws, of which the exterior is by far the largest; the hind feet have five weak claws; but what readily distinguishes this animal is the changeable colour of the hair, which is of a deep glossy green, with copper-coloured reflections: beneath it is of a grayish-brown. Its length is four inches. It is a native of the Cape of Good Hope, according to Mr. Pennant, and not of Siberia, as Seba, who seems to have been its first describer, supposed.

FIG. 2. *Long-tailed Mole. Talpa longicaudata*, LINN. *Condylura longicaudata*, CUV.

This is of the same general form with the common Mole, but is of a rusty brown colour; the end of the nose is radiated by a circular series of longish papillæ, and the tail is two inches long: the claws on the fore feet resemble those of the common Mole; but those of the hind feet are very long and slender: the hind feet are also scaly on their upper surface. This animal is a native of North America. Its length from nose to tail is four inches and six tenths.

FIG. 3. *Common Mole. Talpa Europæa*, LINN. and CUV.

The whole form of the Mole is eminently calculated by Nature for its obscure and subterraneous life. The body is thick and cylindric: the snout slender, but very strong and tendinous: the head not distinguished from the body by any appearance of neck; the legs so extremely short as scarcely to project perceptibly from the body; the fore feet situated obliquely outwards, excessively strong and broad, and furnished with very large and stout claws, so as to give the animal the power of working under the surface with the utmost ease and readiness: the hind feet are small in proportion to the fore feet, and are calculated for throwing back with ease the mould from behind the creature, during its subterraneous progress: the tail is short and small: the skin is much thicker and tougher in proportion than in other quadrupeds, and the fur with which it is covered equally surpasses that of other animals in fineness and softness. The muscular strength of the Mole is very great, and it is enabled to force itself into the ground with an extraordinary degree of celerity. The general length of the Mole is about five inches and three quarters, exclusive of the tail, which measures one inch. This animal is supposed to possess the power of hearing in an exquisite degree; and if at any time it emerges from its subterraneous retreat, instantaneously disappears on the approach of any danger. When first taken, either by digging it out or otherwise, it utters a shrill scream, and prepares for defence by exerting the strength of its claws and teeth. According to the Count de Buffon, so lively and reciprocal an attachment subsists between the male and female, that they seem to dread or disrelish all other society.

The Mole is furnished with eyes so extremely small, that it has been doubted whether they were intended by Nature for distinct vision, or rather merely for giving the creature such a degree of notice of the approach of light as might sufficiently warn it of the danger of exposure.

The fur is so soft and beautiful, that it would make the most elegant articles of dress, did not the difficulty of curing and dressing the skin deter from experiments of this nature.

Genus SOREX. SHREW.

The genus SOREX, in its general appearance, bears a great resemblance to the mouse tribe; but the structure, number, and situation of the teeth prove it to constitute a very different set of animals, which are evidently rather carnivorous than frugivorous. It is more closely allied to the genus TALPA; insomuch that these two genera may be considered as linked to each other by intermediate species, which in habit resemble the one genus, and in teeth the other. It is owing to this circumstance that Linnæus, in the twelfth edition of the Systema Naturæ, has placed one or two genuine species of TALPA in the genus SOREX. The most common species of SOREX in this country is the *S. Araneus*, commonly known by the name of the Shrew Mouse.

FIG. 4. *Minute Shrew. Sorex minutus*, LINN. *Sorex pygmæus*, CUV.

This is an extremely small animal, which inhabits moist places in Siberia, and makes its nest of lichens and mosses under the roots of trees, living on grains, seeds, &c. It is of a subferruginous brown colour above, and whitish below; the head is large; the snout very long and slender, and beset with a row of long whiskers on each side, reaching as far as the eyes. It has no tail: the eyes are small, and the ears short and naked. It is said to run swiftly, and to have a voice like that of a bat. It weighs about a drachm.

FIG. 5. *Musky Shrew. Sorex moschatus*, LINN. *Mygale moschata*, CUV.

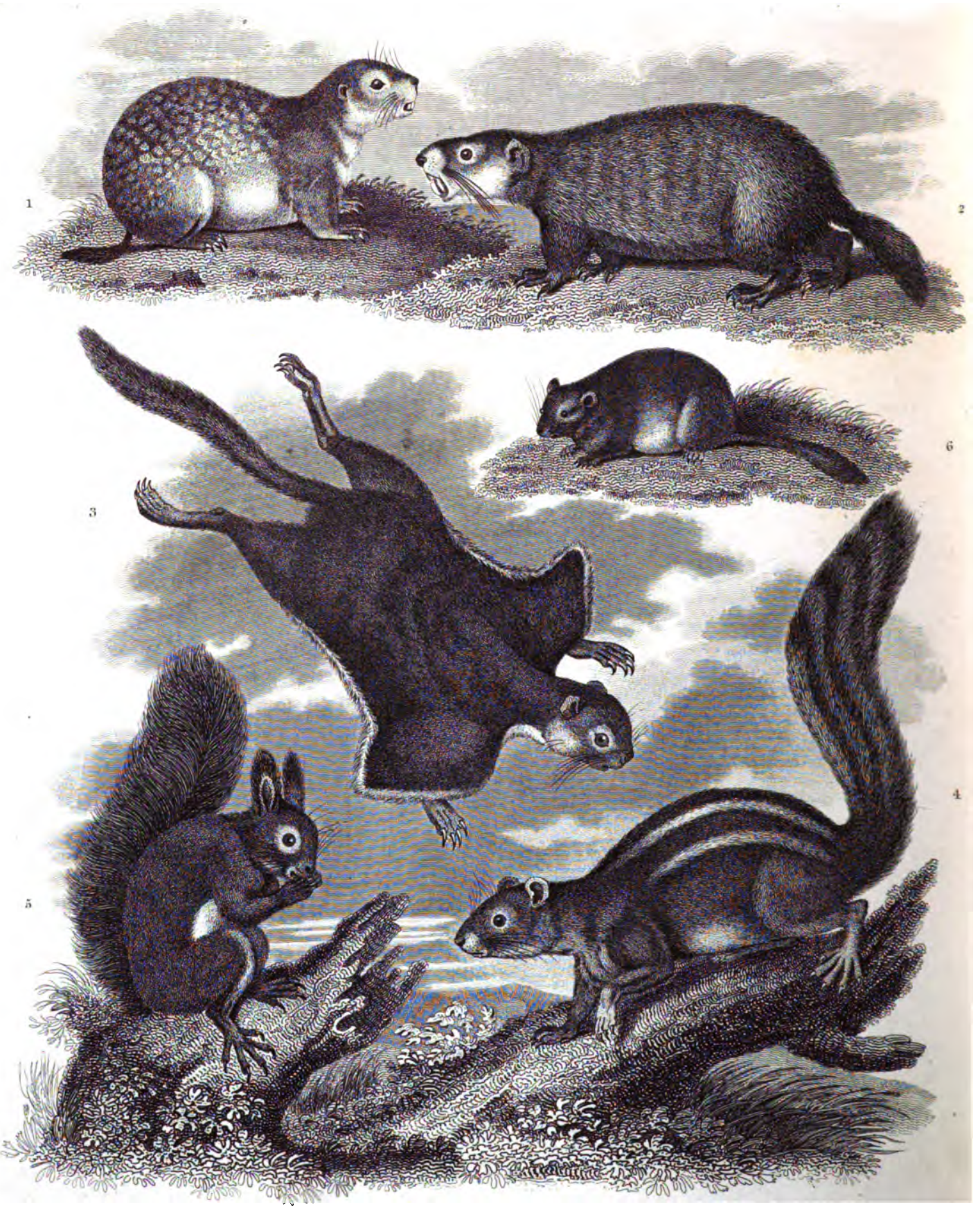
According to Dr. Pallas it chiefly inhabits the river Volga and the adjacent lakes, from Novogorod to Saratof; and it is not found in Russia, nor does its existence in Lapland seem to be well ascertained. It is said to be very seldom seen on land; confining itself to lakes and rivers, in the banks of which it occasionally burrows to a great distance. The general length of the animal is about seven inches from nose to tail, and of the tail eight inches; but it is sometimes found of a larger size. Its colour is a cinereous brown, paler beneath; the body is moderately thick, and rather of a depressed or flattened form; the head rather small; formed as in the rest of this genus, and terminating in a remarkably long and flattened snout, running far beyond the lower jaw: this part of the snout is nearly bare on the upper part, but edged along the sides with a row of vibrissæ or whiskers; and a furrow or line of division runs along its upper part: it is of a seemingly cartilaginous substance, and, in the living animal, very flexible: in the lower jaw are four front teeth, and on each side six canine: the grinders are four on each side in the upper jaw, and three in the lower: the eyes are extremely small, and there are no external ears, but merely the appearance of a pair of small holes at some distance beyond the eyes; the legs are very short, with five toes on all the feet, connected by a naked web or membrane, which is much wider on the hind than on the fore feet; the feet are nearly naked, and of a brown colour: the tail, except at its base, is perfectly naked, marked out into scaly divisions, and is of a brown colour: it is also of a laterally compressed form, and gradually tapers to the extremity: near the base of the tail are situated several small follicles or glandular receptacles, in which is secreted a yellowish fluid, resembling in smell the strongest civet: of this substance about the quantity of a scruple may, it is said, be obtained from each animal.

FIG. 6. *Fœtid Shrew. Sorex Araneus*, LINN. and CUV.

This little animal, which is perhaps the smallest of the European quadrupeds, is a very common inhabitant of fields and gardens, and measures about two inches and a half, and the tail one and a half. Its colour is nearly similar to that of a mouse, but of a somewhat more ferruginous tinge; and the animal is readily distinguished by its long and sharp snout; the

QUADRUPEDS.

CLASS MAMMALIA, ORDER GLIRES, GENUS ARCTOMYS, MARMOT. GENUS SCIURUS, SQUIRREL, GENUS MYOXUS, DORMOUSE.



1. A. Citillus, Variegated M. 2. A. Empetra, Canadian M. 3. S. Petaurista, Taguan or Sailing S.
4. S. Getulus Barbary S. 5. S. Vulgaris, Common S. 6. M. Muscardinus, Common D.

eyes are small and almost hid in the fur. It feeds on roots, grain, insects, and almost any kind of neglected animal substance. It has a very strong and unpleasant smell; and it is remarkable that cats will kill but not eat it. Mr. Pennant observes that there seems to be an annual mortality among these little animals every autumn; numbers of them being found dead at that season by paths and in the fields. It inhabits most parts of Europe, and is also said to be found in Siberia and Kamtschatka. It breeds in holes, under banks, among moss, &c., and is said to produce several young at a time.

Genus Erinaceus.

Generic character. Incisory teeth $\frac{2}{2}$; canines $\frac{1}{1}$; molars $\frac{7}{7}$; total 34; the intermediate upper incisory teeth separate, and are of a cylindrical shape; the canine teeth are smaller than the grinders; the body is thick, covered with prickles on the back and sides, and on the belly, with long stiff tubulate hairs; the crown of the head high; the muzzle acute; the ears are of a medium size, and somewhat rounded; the toes have strong nails; tail very short; and in some species none; the mammæ are ten in number—six of them pectoral, and four ventral.

Fig. 7. *Common Hedgehog. Erinaceus Europæus*, Linn. and Cuv.

Fig. 8. *Madagascar Hedgehog. Var. Erinaceus ecaudatus. Var.* Linn. and Cuv.

Hedgehogs are inhabitants of most temperate parts of Europe, and frequent hedgerows and thickets. They feed on fruits, roots, snails, insects, and also on flesh. We are surprised to see some naturalists of the present day deny this fact. This was well known to Buffon, who says,—"They ate caterpillars, beetles, and worms, and were also very fond of flesh, which they devoured boiled or raw." Later observation proves them also to be predatory animals; and Mr. Woodcock, surgeon, Bury, Lancashire, obtained one from a peasant, which was rolled up, and had in its mouth a toad, the head of which, and one of the legs, were entirely consumed; and, when he attempted to pull it away, the animal seemed to hold the firmer. The hedgehog also feeds on eggs, and does considerable mischief during the breeding season, to game. They have been known to enter a hen-house, drive the hen off her nest, and devour the eggs.

The hedgehog lives in a state of torpidity during the winter. It forms a warm hybernaculum of leaves and moss, in which it conceals itself, generally in a round hole, which it digs at the root of a hedge.

That the hedgehog climbs trees, and disengages the fruit, which they attach to their spines, and carry away when they descend, is quite a fable; and that they suck cattle, is equally absurd.

The Madagascar hedgehog is without a tail.

PLATE CCXX.—QUADRUPEDS.

Mammalia. Order Glires. Genus Arctomys. Genus Sciurus. Genus Myoxus.

Genus Arctomys. Marmot.

Generic character. The incisory teeth are $\frac{4}{2}$, without canine teeth; the grinders are $\frac{5}{5}$; total 22. The incisory teeth are very strong, with their anterior surface rounded; the grinders are tuberculated on their upper surfaces; the head is large, as also the eyes; the ears are very short; the paws are strong; the fore feet with four toes, and the hind feet with five toes; the nails are strong and compressed; tail usually short.

Fig. 1. *Variegated Marmot. Arctomys Citillus*, Linn. *Spermophilus Citillus*, Cuv.

Of all the Marmots this is the most elegant in its appearance, exhibiting generally a beautiful variegation of yellowish-brown and white, the former constituting the ground colour, and the latter the variegations, which are sometimes in the form of spots, and sometimes of transverse undulations: the legs and under parts of the body are of a yellowish white: the tail is short, but well covered with hair, and is brown above and ferruginous beneath: there is scarce any appearance of external ears, but merely an edging to the auditory canal. The length of the animal is about a foot, and of the tail four inches and a half; but this species varies as much in size as in colours, and we are assured by Dr. Pallas, that some of the varieties are scarce larger than the water-rat, while others are nearly equal in size to the Alpine Marmot.

The Variegated Marmot inhabits Bohemia, Austria, Hungary, and from the banks of the Volga to India and Persia; through Siberia and Great Tartary, to Kamtschatka; some of the intervening isles, and even the continent of America.

Fig. 2. *Canadian Marmot*, or *Groundhog. Arctomys Empetera*, Linn.

This is rather larger than the former species; its head is much smaller in proportion, and round; its ears are very short; the cheeks are ash gray, and its nose black; the fur of the body is of a curious roan colour, from the hairs being gray at bottom, black in the middle, and white at the tips; the belly and legs are of a high-toned fawn, approaching to orange; its toes are black, and naked; the tail short, and rather bushy.

This species inhabits Hudson's Bay, and the northern parts of Canada and the United States.

Genus Sciurus.

Generic character. The incisory teeth are $\frac{2}{2}$; there are no canine teeth; the grinders are $\frac{5}{5}$; total 22. The upper incisory teeth are flat in front, and wedge-shaped at the extremity; the lower ones are pointed and compressed laterally; the grinders are tubercular; the body is small; the ears erect; the head small; the eyes large; the fore feet with four long toes, and a tubercle in place of a thumb; the hind feet have five long toes; the whole are furnished with crooked nails; the tail long, and often with long hairs, disposed in two rows; with two pectoral, and six ventral teats.

Fig. 3. *Taguan*, or *Sailing Squirrel. Sciurus Petaurista*, Linn. *Pteromys Petaurista*, Cuv.

This animal has been termed by naturalists the flying squirrel. It is particularly distinguished by a membranous continuation of the skin of the sides and belly, which extends from the fore to the hind feet, and assists it greatly in making leaps from one tree to another, frequently at a distance of twenty-five to thirty-six feet. This species is about nine inches in its whole length, of which its tail occupies five.

The flying pteromys is found in the woods of Lapland and Norway, where it feeds principally on the tender branches of pine and beech trees. It does not become torpid during the winter, like many of the smaller animals of the cold regions which it inhabits.

In the act of leaping, the loose skin is stretched out by the feet, and the surface of the body is thereby greatly augmented; and its leaping has much the appearance of flying. Where numbers of them are seen leaping together, they appear like leaves blown off by the wind.

The females of this species are devotedly attached to their young, and never quit their nest but when pressed by hunger; and, on these occasions, they carefully wrap up the nest with moss.

Fig. 4. *Barbary Squirrel. Sciurus Getulus*, Linn. and Cuv.

This species is of the size of a common squirrel, and of a reddish brown colour, with the legs somewhat paler, and the belly white: the body is marked on each side with longitudinal white stripes, and the tail is barred or shaded with alternate dark and light stripes: the ears are plain or without tufts, and are whitish, as are likewise the orbits of the eyes. It is a native of Barbary.

Fig. 5. *Common European Squirrel. Sciurus vulgaris*, Linn. and Cuv.

This species is of a bright brown colour, inclining to red on the upper parts of the body and sides; the breast and belly are white; the ears are fringed with long tufts of upright hairs; the eyes are large, black, and lively; the fore legs are furnished with long stiff hairs, like whiskers, which project forward; its tail is long, and very bushy, which it generally carries over its back; and when engaged in eating, it sits upright, and uses its fore feet like hands, to convey the food to its mouth. The size of this species is about eight inches in length, exclusive of the tail, which is seven inches long.

The squirrel is a lively little animal; and in the spring is peculiarly active, leaping from branch to branch with surprising quickness. Squirrels form their nests in high trees, where the branches begin to fork into small ones. If they can find a natural hollow in such situations, it is preferred by them. They commence by making a level between these forks, and then bind the whole with moss, dry leaves, and twigs, in such a manner that they withstand any storm. The whole inside is lined with wool, or such other soft substances as they can pick up. It is covered on all sides, with only a single opening, just large enough to permit the animal to enter; and even this is protected from the influence of the wind, by a kind of canopy formed in the shape of a cone, to throw off the rain.

This animal is to be found in vast numbers in the larger woods in all parts of Europe, and the north of Asia. In northern countries the colour of their fur is changed in winter to gray; and, what is remarkable, this transition takes place even in a domesticated state, where the animal is not exposed to the rigours of the climate. This change, according to Dr. Pallas, commences about the 4th of October, and, within a month, the whole fur has assumed the hoary appearance.

Fig. 6. *Common Dormouse. Myoxus muscardinus*, Linn. *Myoxus Glis*, Cuv.

The size of this animal is nearly equal to that of a mouse, but it is of a more plump or rounded form, and the nose is more obtuse in proportion: the eyes are large, black, and prominent; the ears broad, thin, and semi-transparent: the fore feet have four toes, and the hind feet five, but the interior of these latter are destitute of nails: the tail is about two inches and a half long, and closely covered on all sides with hair, which is rather longer towards the tip than on the other parts: the head, back, sides, belly, and tail, are of a tawny red colour; the throat white: the fur is remarkably soft, and the whole animal has a considerable degree of elegance in its appearance. It sometimes happens that the colour is rather brown than reddish.

Dormice, says Mr. Pennant, inhabit woods or very thick hedges; forming their nests in the hollows of some low tree, or near the bottom of a close shrub. As they want much of the sprightliness of the squirrel, they never aspire to the tops of trees, or attempt to bound from spray to spray. Like the squirrel, they form little magazines of nuts, &c. for their winter provision, and take their food in the same upright posture. The consumption of their hoard during the rigour of winter is but small, for they sleep most part of the time, retiring into their holes on the approach of winter, and, rolling themselves up, lie torpid during the greatest part of the gloomy season. Sometimes they experience a short revival in a warm sunny day; when they take a little food, and then relapse into their former state.

These animals seldom appear far from their retreats, or in any exposed situations; for which reason they seem less common in this country than they really are. They make their nest of grass, moss, and dead leaves. According to the Count de Buffon it consists of interwoven herbs, and is six inches in diameter, open only above, and is situated between the branches of hazel and brushwood. The number of young is generally three or four.

PLATE CCXXI.—ORNITHOLOGY.

Water Birds. Order Anseres. Genus Mergus and Merganser. Genus Alca. Genus Aptenodytes.

Genus Mergus. Smew.

Linnæus did not separate the genus Mergus from that of Merganser, but later zoologists have thought proper to do so, because of the inferior size of the beak, and the smaller serratures with which its edges are furnished, as well as the fact that it feeds more exclusively upon crustaceous animals than the Mergansers.

Genus Merganser. Merganser.

The Mergansers have the beak as long as the head, and more slender and deeply serrated in proportion than the Smews: this part has each mandible armed, throughout its length, with a row of small pointed teeth, similar to those of a saw, and pointing backwards: the tip of the upper mandible is hooked. The swelling of the lower larynx of the trachea in the males is very large, and is partly membranaceous. These birds feed chiefly upon fish.

Fig. 1. *Goosander. Mergus Merganser*, Linn.

About thirty inches in length: the male has a short-tufted crest. This species inhabits the arctic regions of the old and new continents, migrating to the south upon the approach of winter: during which season it is particularly abundant in Holland and France, but in very severe frosts retiring to the lakes in the more internal parts of the continent. It occurs but sparingly in Great Britain, unless during very hard winters, when they are common on the fresh-water pools, rivers, and fens of the East Riding of Yorkshire, and in the fens of Lincolnshire. They remain, according to Pennant, all the year in the Orkneys, and are found during the summer in the Hebrides. They retire to the north to breed, the female making her nest among the loose stones on the borders of rivers, or in a hollow tree; she usually lays from twelve to fourteen whitish eggs, which are of nearly equal diameter at each end. These birds generally feed on fish, amphibious animals, or marine mollusca, which renders their flesh very unpalatable, and being wherewithal very lean and rancid, it is held in very little estimation.

Fig. 2. *Hooded* or *Crested Merganser. Merganser Cucullatus*, Linn.

The Hooded Merganser is eighteen in length, and two feet in extent: beak blackish-red, narrow, thickly toothed, and furnished with a projecting nail at the extremity: the head is ornamented with a large circular crest, which the bird has the faculty of elevating or depressing at pleasure.

This species appears to be peculiar to North America: it is said to arrive at Hudson's Bay about the end of May: it builds on the borders of the lakes; the female laying six white eggs, in a nest composed of grass, lined with feathers plucked from her breast. This species is migratory, and proceeds southwards



GENUS *MERGUS* (Merganser)

1 M. *Merganser* GOOSANDER
2 M. *Cucullatus* CRESTED M.
3. M. *Albellus* SMEW

GENUS *ALCA* (Auk)

4 A. *Antiqua* ANCIENT A.
5. A. *Cirrata* TUFTED A.

GENUS *APTENODYTES* (Penguin)

6 A. *Patachonica* PATAGONIAN P.
7 A. *Papua* PAPUAN P.
8. A. *Minor* LITTLE P.

Div. 1. Land Birds – Order PASSERES.



GENUS *TURDUS*

(Thrush)

1.T. *Orpheus* MOCKING T. — 2.T. *Rex* KING T. — 3.T. *perspicillatus* SPECTACLE T. — 4.T. *crassirostris* THICK BILLED T. — 5.T. *cyanurus* BLUE TAILED T. — 6.T. *longirostris* LONG BILLED T.

during the severity of the winter; occurring during that season in several of the United States of America.

Fig. 3. *Smew. Merganser albellus.* Shaw.

Length about seventeen inches. The Smew inhabits the arctic regions of the two worlds; and in the autumn and throughout the winter is plentiful in England, France, Germany, Holland, and sometimes as far south as Italy. It frequents our coasts and fresh waters in the winter, but has not been known to breed in this country. It is said to lay from ten to a dozen whitish eggs. It is a very shy species, and readily takes wing when surprised: is equally expert in air as in water, and is with difficulty shot. Its principal food is small crustacea and fish, after which it dives with great ease, and remains for a long period under water.

Genus Alca. Auk.

This extraordinary genus, of which there is but one species known, approximates very closely to the true Penguins, or the birds of the second division of this family; they also bear a great resemblance to the Razor-bills, except in the length of the wings, which in this bird are very short, so short as totally to incapacitate it for flying: it lays but one egg.

Fig. 4. *Ancient Auk. Alca antiqua*, Linn.

Length near eleven inches: beak with its base white, and from the nostrils to the tip black; the feathers come very forward thereon; and the eyes, in consequence, appear to be placed far back in the head: this part, as also the sides and throat, are deep black: the upper part of the body and wings are dusky black: the under part of a pure white: on the ears, just behind the eyes, spring several long narrow white feathers, which fall down on each side of the neck and unite at the lower part, forming a kind of crescent; they are somewhat curled at the base, where they are most numerous: the legs are placed very far back, and are dusky: the tail is short, rounded, and black.

Inhabits various parts of the northern Pacific Ocean, from North America to Kamtschatka and the Kurile Islands.

Fig. 5. *Tufted Auk. Alca cirrata*, Linn.

Latham states, that it is found at Kamtschatka and the neighbouring islands: the natives of which places formerly used their beaks as amulets or charms; and at present make use of their skins for clothing. They are stated to lay one egg only: their food consists of crabs, shrimps, and testacea: they burrow under ground, and line their nest with feathers.

Genus Aptenodytes. Penguin.

The true Penguins have the beak slender, long, and pointed; the upper mandible is slightly arcuated on the top, and covered for a third of its length with feathers, in which the nostrils are placed; from the latter to the tip is a groove.

Fig. 6. *Patagonian Penguin. Aptenodytes Patachonica*, Linn.

The Patagonian Penguin is thus commemorated by Latham: "This is the largest of the species known, being four feet three inches in length, and stands erect at least three feet; the weight forty pounds: the beak is four inches and a half in length, more slender in proportion than in any of the species, and bends towards the tip; the colour of it black for two-thirds of the length, and from thence to the point yellowish; the under mandible orange at the base and black at the tip: the tongue is half the length of the beak, and armed on each side with spikes turning backwards: the irides are hazel: the head, throat, and hind part of the neck are of a deep brown: the back of a deep ash-colour, each feather bluish towards the tip: the under parts are pure white: on each side of the head, beginning under the eye, and behind it, is a broad stripe of fine yellow; this advances forward as it proceeds down the neck, where it grows narrower and paler; and at last blends itself with the white on the breast; this appearance, however, is only when the neck is stretched, for the state in which the bird usually carries itself is with the head rather crouched in between the shoulders, where the yellow appears encircling the neck as a necklace: the wings are of the usual form, but larger in proportion: the legs scaly and black."

Natives of the Falkland Islands, New Guinea, New Georgia, and other parts adjoining the Antarctic seas. Their principal food consists of crabs, testacea, and mollusca: they frequent sequestered places, and occur in large flocks: their flesh, although black, is eatable.

Fig. 7. *Papuan Penguin. Aptenodytes papua*, Linn.

Length thirty inches: beak red, four inches long; the upper mandible slightly bent at the tip; the under a little pointed: the irides reddish-yellow: the head and upper half and back of the neck bluish-dusky-black: over the eye, on each side of the head, is a large patch of white, which reaches backwards nearly to the occiput; and across the top of the head is a bar of the same colour, uniting the patches together: the under parts of the body are white: the wings are black above, with their tips, lower edge, and insides white: tail wedge-shaped: legs reddish: webs dusky: claws black.

Inhabits New Guinea, Falkland Islands, and Kuërguelen's Land.

Fig. 8. *Little Penguin. Aptenodytes minor*, Linn.

Figured and described by Latham: "Size of a Teal: length fifteen inches: beak an inch and a half long; in shape like that of the Red-footed; colour dusky; the under mandible somewhat truncated, and blue at the base: irides livid: the upper parts of the bird, from head to tail, appear cinereous blue, the ends of the feathers being of that colour, but the base of them is brown-black; the shafts of each feather black: round the eye and a little way below on each side is a bed of pale brownish-ash colour: the under parts, from chin to vent, white: wings dusky above, and white beneath: tail very short, and consists of sixteen stiff feathers, but is scarce perceivable, except in the feathers appearing a little elongated at that part: legs dull red: webs dusky: claws black."

Not unfrequent on the rocks of the southern parts of New Zealand, especially in Dusky Bay: they lay their eggs in deep burrows formed on the sides of the hills: the natives knock them down with sticks, and feed upon their flesh.

PLATE CCXXII.—ORNITHOLOGY.

Order Passeres. Genus Turdus.

Genus Turdus. Thrush.

The Thrushes are extremely numerous, and are found nearly in every part of the world: they feed principally on berries, but many species will also eat snails, slugs, earth-worms, &c. especially in the winter: many of them are greatly admired for their songs, which are very melodious: their nests are generally constructed on the branches of trees, and most of the species lay from four to six eggs.

Fig. 1. *Mocking Thrush. Turdus Orpheus*, Linn. *Turdus polyglottis*, Cuv.

M. Vieillot was the first author that put the three Mocking Thrushes together, in which he appears to be quite correct, as the descriptions of each do not differ specifically from each other, and the variation is not more than would occur in different stages of moulting, or, perhaps, age of the bird. Its most general appearance is as follows: the beak is black, with a series of reflected bristles at its base: the cheeks and stripe over the eyes grayish-white: irides yellow: the top of the head and neck, the shoulders, and the upper parts of the wings, gray-brown: quills brown; the primaries with a white spot in the

middle: greater wing-coverts tipped with white: tail-feathers dusky-brown; the two outer ones entirely white, the four following white at their tips only: the throat and all the under parts of the body grayish-white: the feet black: the length of the bird eight inches and a half: female has the colours duller: the young bird has the breast and belly longitudinally spotted with brown; the white on the wings dirty; the wing-coverts, scapulars, and back, reddish; the feet and beak brown.

This remarkable bird receives its name from its amazing powers of voice, being able to imitate that of almost every species of animal, and also noises that are produced artificially, such as the creaking of a door, wheel, or the like; and its versatility almost exceeds its imitative powers, changing from the soft notes of the Wood Thrush to the discordant jarring of the Whip-poor-Will, then instantly reverting to its original song, and breaking out with the screeching of a Hawk: it has a very fine natural note: it is so much esteemed in America, that it was very difficult to procure any in the vicinity of Philadelphia, a few years since, from the young birds being taken so frequently; a fine bird has been known to fetch one hundred dollars and upwards: its general haunts are in moist shady woods, where it builds its nest, which is composed of dry sticks and twigs, mixed with straw, hay, pieces of wood and tow, and lined with a thick layer of light brown fibrous roots: its eggs are four or five in number, of an ash-coloured blue, sprinkled with brown blotches: the female sits fourteen days, and has generally two, and if disturbed, three broods in the year.

Immense numbers of these birds are taken in some parts of the United States, for the purpose of keeping in confinement on account of their songs; and amongst them many young ones are captured, which are far from being difficult to rear, as they will bear great fatigue, and only require to be kept clean and well fed: when first taken they will endeavour to escape through the wires of their cages, and will kill themselves if the upper parts of them be not made of wood, so as entirely to obstruct their view: they are fond of berries of various sorts, and also insects. They are found throughout all parts of North America, and great part of the West Indies.

Fig. 2. *King Thrush. Turdus Rex*, Linn. *Myothera Rex*, Cuv.

Tail only an inch in length. Native of Guiana, and feeds upon ants.

Fig. 3. *Spectacle Thrush. Turdus perspiculatus*, Linn. and Cuv.

This singular-looking bird, of which we have given a figure, is rather larger than the Blackbird: it is in length eight inches and a half: its beak is dusky: the head and neck ash-coloured, inclining to brown towards the breast: forehead and circle surrounding each eye black, appearing like a pair of spectacles: upper parts of the body greenish-gray: breast and belly dirty yellowish-white: the middle tail-feathers greenish-brown; the side ones much darker: tail slightly wedged: legs yellow. Inhabits China.

Fig. 4. *Thick-billed Thrush. Turdus crassirostris*, Linn.

This species was met with in New Zealand, both in Dusky Bay and Queen Charlotte's Sound: it is known by the name of *Golò-beoo*.

Fig. 5. *Blue-tailed Thrush. Turdus cyanurus*, Linn. *Myothera cyanura*, Cuv. Native of Guiana, where, however, it is rare. A most beautiful species.

Fig. 6. *Long-billed Thrush. Turdus longirostris*, Linn.

The beak of this species is very long in proportion to the size of the bird, being above an inch and a half in length, and of a brownish flesh-colour: the feathers on the head are short and pointed.

PLATE CCXXIII.—ICHTHYOLOGY.

The genus Atherina, among fishes, is distinguished by having the upper jaw rather flat, six rays in the gill-membrane, and a silvery stripe on each side of the body.

Fig. 1. *Atherina hespeta*, Linn. and Cuv. Common Atherine.

The Mugil, or Mullet, has membranaceous lips, the inferior one being carinated inwards; they have no teeth, and the opercula are smooth and round.

Fig. 2. *Mugil tang*, Linn. and Cuv.

Fig. 3. *Mugil cephalus*, Linn. and Cuv.

These fish are very cunning, often escaping over a net, which is no sooner done by one, than all the rest follow. They are much esteemed for food, and are taken in vast numbers on the coast of France.

The genus Exocetus has the head scaly, mouth without teeth, jaws connected at each side; ten rays in the gill-membrane; pectoral fins large and formed for flying. They constitute the *Flying-fishes*, so familiar to voyagers.

Fig. 4. *Exocetus volitans*, Linn. and Cuv. Flying-fish.

This species is abundant in the tropical region of the Atlantic, and has even been seen as far north as Britain. They fly for a considerable distance above the water, and thus elude the vigilance of the Porpoise and other large fishes; but in their flight they are often overtaken by gulls and other sea-birds, and destroyed.

Fig. 5. *Exocetus exiliens*, Linn. and Cuv. Swallow-fish.

In this species the ventral fin reaches to the tail. It inhabits the Red Sea and Mediterranean.

Fig. 6. *Exocetus mesogaster*, Linn. and Cuv. Atlantic Flying-fish.

This species has the ventral fin in the middle of the abdomen. A native of the Atlantic seas.

PLATE CCXXIV.—ICHTHYOLOGY.

The genus Trachinus has the head compressed; gill-membrane six-rayed; the lower lamina of the opercula is serrated.

Fig. 1. *Trachinus major*, Linn. and Cuv.

Fig. 2. *Trachinus draco*, Linn. and Cuv.

In Uranoscopus the head is depressed, rough, and large; the mouth has the upper jaw shorter than the lower, and the gill-membrane has five rays.

Fig. 3. *Uranoscopus scaber*, Linn. and Cuv. Star-gazer.

In Callionymus the upper lip is doubled, or folded in two plaits; eyes approximate; gill-membrane six-rayed; gill-covers shut; body naked; ventral fin remote.

Fig. 4. *Callionymus dracunculus*, Linn. and Cuv. Sordid Dragonet.

Fig. 5. *Callionymus lyra*, Linn. and Cuv. Gemmous Dragonet.

PLATE CCXXV.—ENTOMOLOGY.

The genus Ammophilus, of Kirby, has the mandibles dentated, the palpi filiform and almost equal, the maxillæ and lingula very long, in the form of a proboscis, and bent underneath.

Fig. 1. *Ammophilus sabulosus*, Lat. Kirby.

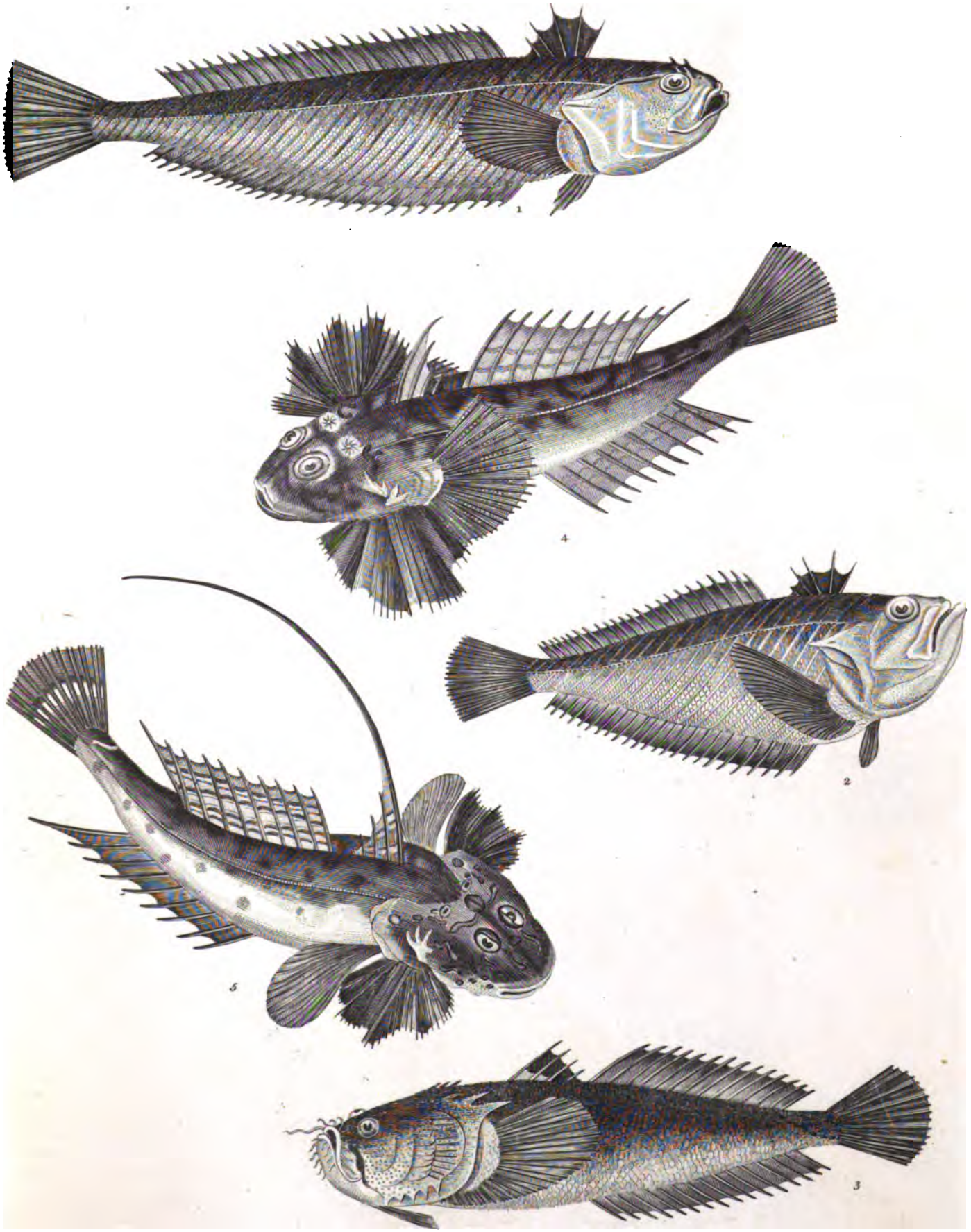
The genus Scolia is marked by a mouth with a sharp curved mandible; jaw projecting and horny; tongue inflected, trifid and



G. ATHERINE (Atherine) 1. A. Hepsetus

G. MUGIL (Mullet) 2. M. Tang 3. M. Cephalus

GENUS EXOCŒTUS (Flying Fish) 4. E. evolans 5. E. exiliens 6. E. Mesogaster



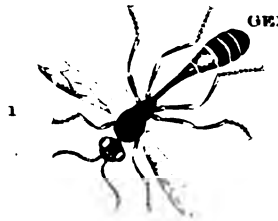
GEN. *TRACHINUS* (Weever)
1. T. *major* — GREAT W.
2. T. *draco* — SMALL W.

G. *URANOSCOPUS* (Star-gazer)
3. U. *scaber* — ROUGH S.

G. *CALLIONYMUS* (Dragonet)
4. C. *dracunculus* — SORDID D.
5. C. *lyra*

Order Hymenoptera.

GENUS *AMMOPHILA_G.SCOLIA_G.THYNNUS_G.LEUCOPSIS_G.TIPHIA G.CHALCIS_G.CHRYSIS.*























1 A.sabulosa
2 S.flavifrons
3 Th.emarginatus
4 L.dorsigera
5 Tip.rudata

6. Tip.villosa
7. Cha.sispes

8. Chr.splendida
9 Chr.amethystina
10 Chr.fasciata
11 Chr.ignita
* *magnified*

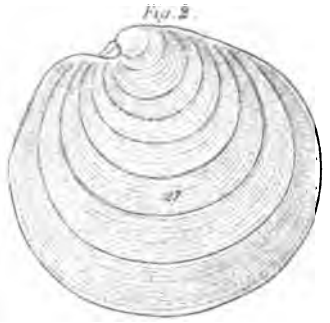
G.M

CONCHOLOGY.

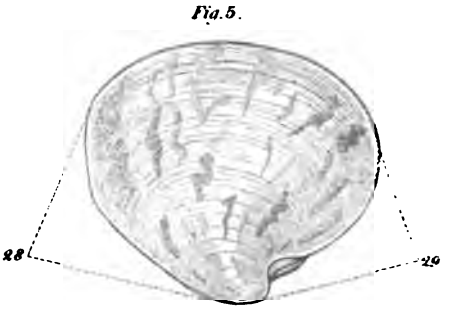
Elementary.

BIVALVES.

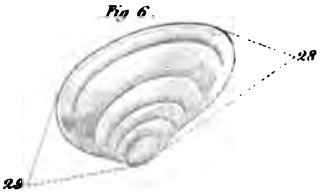




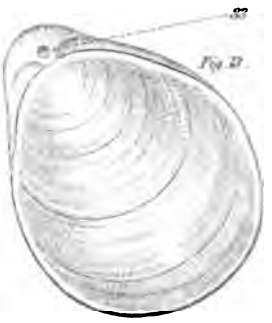


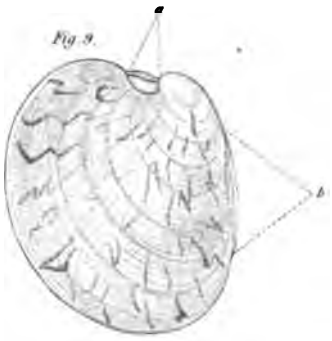


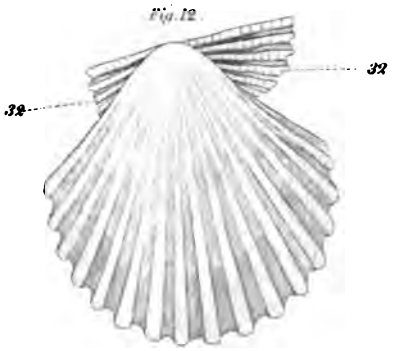


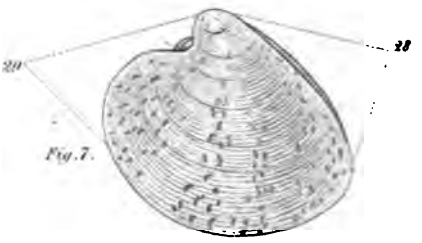


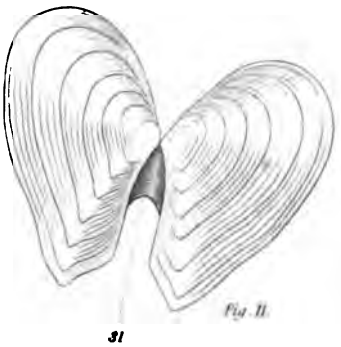


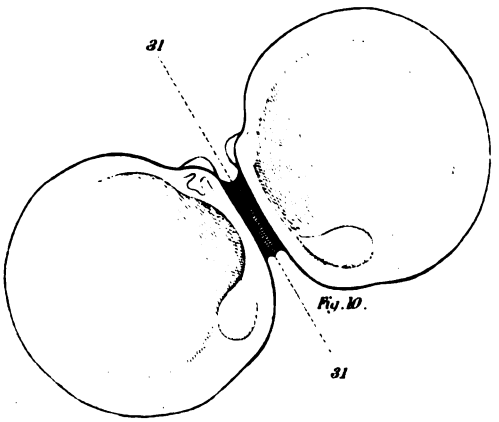


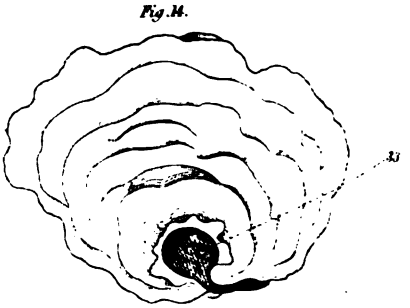








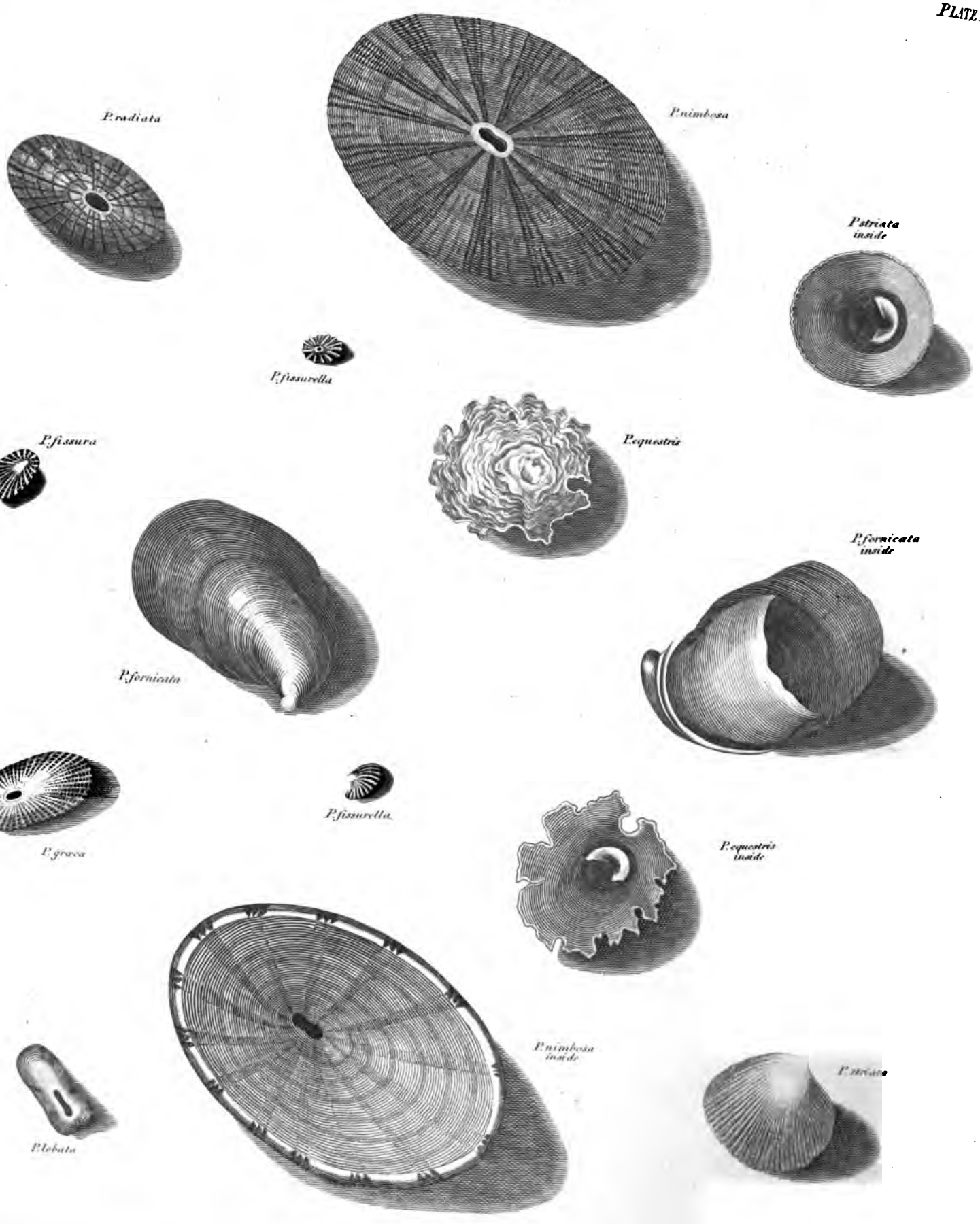




26 Margin *or* Limb. 27 Disk. 28 Anterior Slope. 29 Posterior Slope. 30 Lunule. *a b*. 31 Cartilage. 32 Ears. 33 Ligament perforation

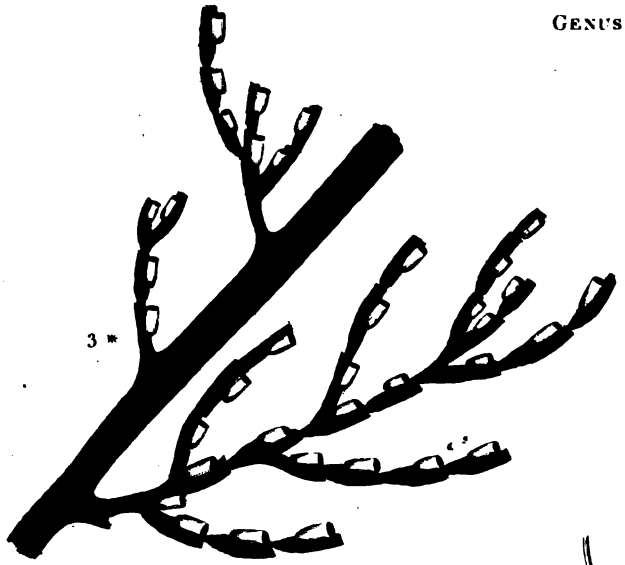
CONCHOLOGY.

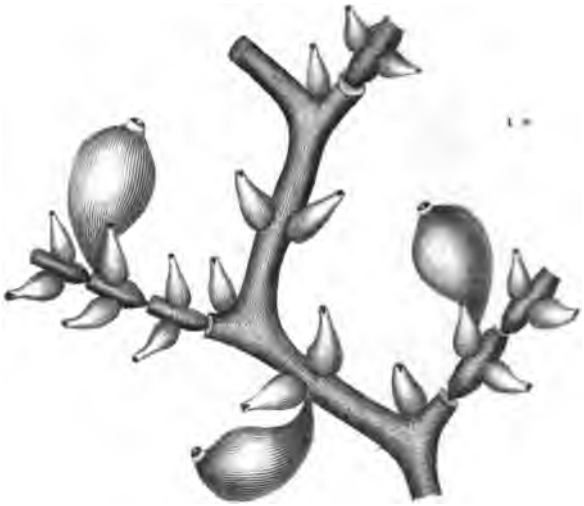
GENUS *PATELLA.*



Order Zoophytes

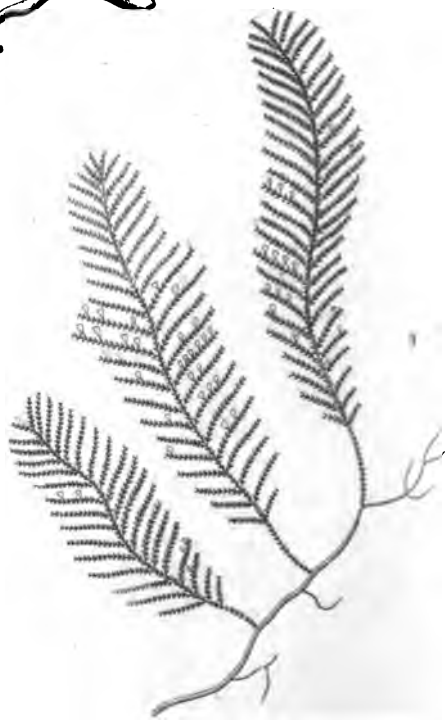
GENUS *SERTULARIA*



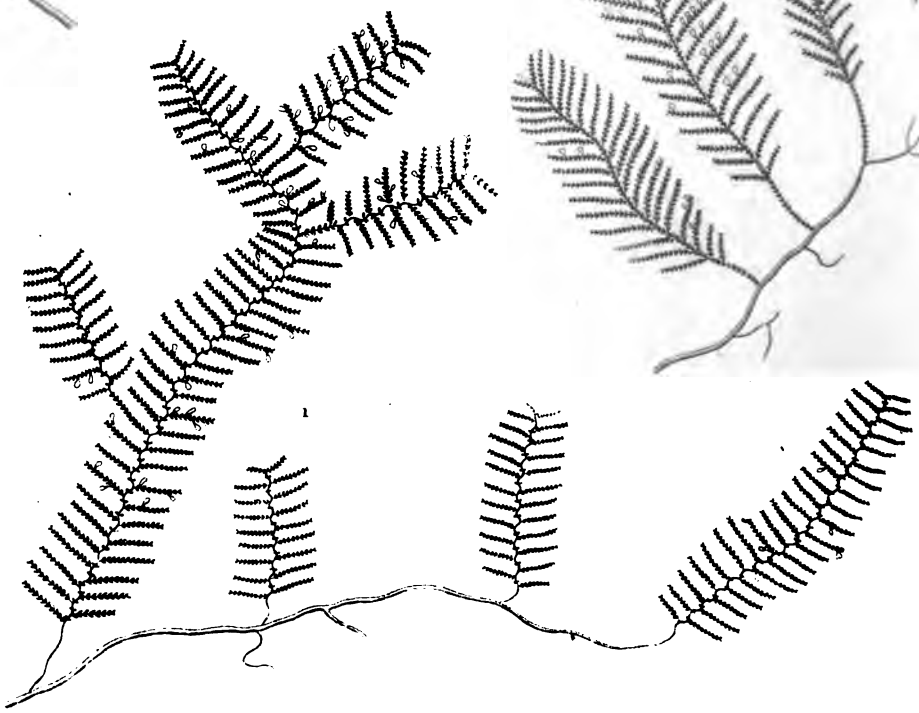












1. Sertularia frutescens
2. S quadridentata
3. S pinaster
4. S filicula

* *magnified*

VEGETABLE ANATOMY.

BARK.

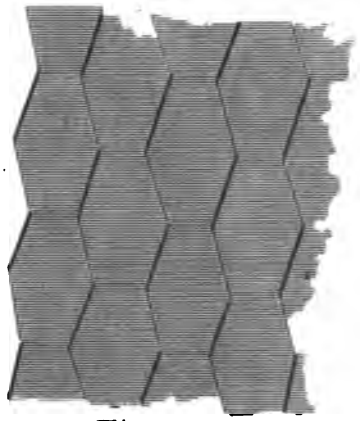


Fig. 2.

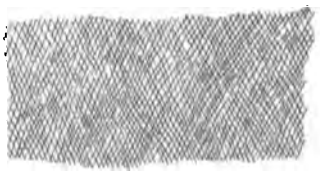


Fig. 11.

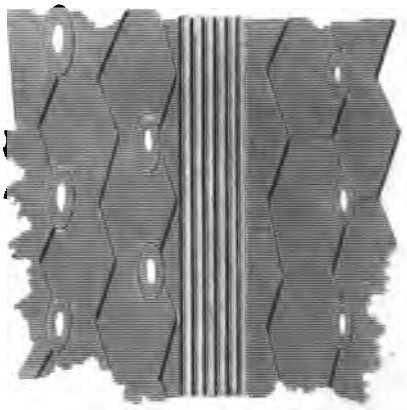


Fig. 3.

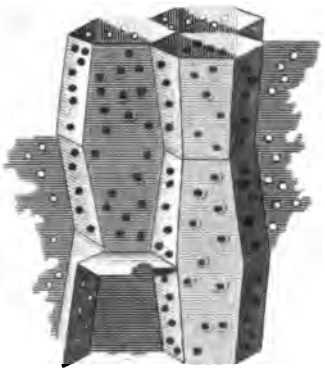


Fig. 5.

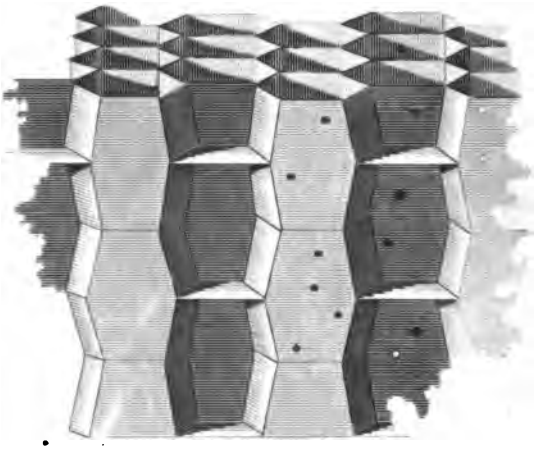


Fig. 4.



Fig. 7.



Fig. 9.



Fig. 6.



Fig. 1.



Fig. 10.

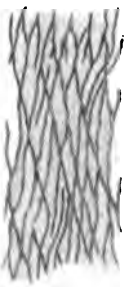


Fig. 8.

very short; lip projecting and entire; feelers four, short and filiform: antennæ thick and filiform.

Fig. 2. *Scolia flavifrons*, Linn. and Lat.

The genus Thynnus is characterized by a horny mouth, a bent mandible, with a short jaw, straight; lip larger than the jaws, apex membranaceous, trifid; the four palpi filiform and equal.

Fig. 3. *Thynnus emarginatus*, Linn. and Lat.

The genus Leucopsis is characterized as follows: the mouth is horny, with short jaws; mandible thick, and trifid; lip membranaceous; four feelers, short, equal, and filiform; antennæ short and clavate; wings folded; sting reflexed.

Fig. 4. *Leucopsis dorsigera*, Linn. and Lat.

The genus Tiphia is characterized by a membranaceous, rounded jaw; mandible arched, and acute, lip short and tridentate, and no tongue: feelers four, filiform and unequal; antennæ arched, not filiform.

Fig. 5. *Tiphia nudatata*, Linn. and Lat.

Fig. 6. *Tiphia villosa*, Linn. and Lat.

The genus Chalcis has four equal palpi; antennæ short, cylindrical, and fusiform.

Fig. 7. *Chalcis sispes*, Lat.

In Chrysis the mouth is horny and projecting; jaws advanced, horny, with a single tooth; lip tongue-shaped; palpi four in number, unequal and filiform.

Fig. 8. *Chrysis splendida*, Linn. and Lat.

Fig. 9. *Chrysis amethystina*, Linn. and Lat.

Fig. 10. *Chrysis fasciata*, Linn. and Lat.

Fig. 11. *Chrysis ignita*, Linn. and Lat.

PLATE CCXXVI.—CONCHOLOGY.

The annexed plate is chiefly designed to illustrate the names usually applied to the different parts of bivalve shells.

Fig. 1. Represents a small *Venus*, and the number 27 marks its disk, or exterior superficies.

Fig. 2. Is a *Lucina*, in which the orbicular disk is marked by the same numeral, 27.

Fig. 3. Is a *Tellina*, in which the disk is ovate-triangular.

Fig. 4. Is a small *Venus*, in which the numeral 26 indicates the margin.

Fig. 5. Is another species of *Venus*, in which 28 shows the anterior slope, and 29 the posterior slope of the shell.

Fig. 6. Is a *Donax*, in which the same parts are represented.

Fig. 7. Is a *Venus*, illustrating the same parts.

Fig. 8. Is an *Erycina*, the letters *a* and *b* showing the lunule.

Fig. 9. Is a *Venus*, *a* and *b* marking the lunule.

Fig. 10. Is a *Lucina*, the numeral 31 marking the cartilage (by some called the ligament) uniting the two valves together.

Fig. 11. Is a *Tellina*, in which the same part is shown.

Fig. 12. Is a *Pecten*, the numeral 32 showing the auricles, or ears.

Fig. 13. Is a *Terebratula*, the numeral 33 pointing out the foramen, or ligament perforation, through which the animal protrudes a *byssus*, by which it adheres to rocks, &c.

Fig. 14. Is the common *Anomia epiphium*, in which the foramen is also shown.

PLATE CCXXVII.—CONCHOLOGY.

The characters of the Linnæan genus Patella were given on a former occasion; when it was also remarked the genus has since been subdivided into many other genera, of which the annexed plate illustrates a number.

In the genus Fissurella of Lamark, there is a broad fleshy disk under the belly, a conical shell on the back, nearly or quite covering it, and perforated at its apex by an aperture, through which the excretions are thrown out, and the water admitted for the purposes of respiration. The eyes are on the external base of the conical tentacula.

Fig. 1, 2. *Fissurella nimbosa*, Lam. *Patella nimbosa*, Linn. Of an oval form, with radiated striæ disposed in fasciculi: colour brownish. Inhabits the Mediterranean Sea.

Fig. 3. *Fissurella radiata*, Lam. *Patella radiata*, Linn. Elliptical-oblong, with a large perforation, and radiated striæ.

Fig. 4. *Fissurella græca*, Lam. *Patella græca*, Linn. Shell ovate, convex, reticulate; margin, inwardly crenate. Inhabits the coast of Britain.

Fig. 5, 6. *Fissurella*, Lam. *Patella fissurella*, Linn. Shell grooved, and perforated on the fore part; apex recurved. Inhabits the Iceland seas.

Fig. 7. *Fissurella lobata*, Lam. *Patella lobata*, Linn. Shell oblong-ovate, arcuated at the sides.

The genus Emarginula resembles the Fissurella, excepting that instead of a hole in the summit, there is a small cleft in the anterior margin of the mantle and shell.

Fig. 8. *Emarginula fissura*, Lam. *Patella fissura*, Linn. Shell ovate, conical, with reticulated striæ. Inhabits the coast of Europe.

The genus Calyptræa has a conical shell, in the hollow of which is a little lamina that projects inwards, interposing itself between a fold of the abdominal sac.

PLATE CCXXVIII.—ZOOPHYTES.

The genus Sertularia of Linnæus has a corneous stem, sometimes simple, sometimes ramous, on the sides of which are cells, extremely various in form, and occupied by the polypi: they are all connected with a gelatinous stem that traverses the axis, like the medulla of a tree. They propagate by ova, or buds, which are developed in cells larger than the rest, and of a different form.

In the Sertulariæ, as restricted by later naturalists, are embraced those only in which the cells are placed on both sides of the stem, either oppositely, or alternately.

Fig. 1. *Sertularia frutescens*, Linn. and Cuv.

Fig. 1*. Same greatly magnified.

Fig. 2. *Sertularia quadridentata*, Linn. and Cuv.

Fig. 2*. Same greatly magnified.

Fig. 3. *Sertularia pinaster*, Linn. and Cuv.

Fig. 3*. Same magnified.

Fig. 4. *Sertularia filicuta*, Linn. and Cuv.

Fig. 4*. Same magnified.

PLATE CCXXIX.—VEGETABLE ANATOMY.

The annexed plate is designed as an additional illustration of *vegetable anatomy*, of which some account has been already given.

Fig. 1. Represents a portion of the *Epidermis*, or cuticle of plants, separated, by cautious dissection, from the subjacent cellular membrane. When thus prepared and inspected under water or spirits, it has a net-like appearance, with a pellucid membrane spread between the meshes.

Fig. 2. Represents a portion of the cuticle magnified, and showing the reticulated appearance of the epidermis in illustration of the idea of Mirbel, who supposes that the lines from which the retiform structure is derived, correspond in figure with the cells of the *Parenchyma*, and are really the termination of the septa of these cells in the cuticle.

Fig. 3. Represents the *tubular tissue* which in some cases is perceived upon the superficies of plants, and which also enters into the composition of the epidermis. These tubes, however, are found to be elongated cells.

Fig. 4. Shows the *herbaceous tissue*, which is composed of hexagonal cells, so applied to each other that each of the sides assists in forming the parietes of the adjoining cell.

Fig. 5. Also represents the cells somewhat elongated, and also the *pores* or *foramina* which establish a communication between the several apartments. These pores are not above the 300dth part of a line in diameter.

Fig. 6. *Cortical plexus* of Duhamel. When the epidermis and cellular envelop have been removed, we find the remainder of the bark made up of reticulated fibres, which often touch each other, or anastomose, so that the individual fibres are somewhat curved. These meshes are also filled up with a fine web.

Fig. 7. Illustrates the fact that the cortical layers just mentioned, are not single, but consist of concentric laminæ. The cellular tissue passes through all these meshes, which Malpighi compared to a kind of cloth, calling the longitudinal fibres the *warp*, and the transverse fibres the *weft*.

Figs. 8, 9 and 10. Show the deeper seated net-works, which become smaller as they are further removed from the surface.

Fig. 11. The *cortical plexus* arranged in gauze or lace, as seen in the *Largetto*, or Lace-bark tree.

PLATE CCXXX.—QUADRUPEDS.

Dishley Sheep.

We have already, in the course of this work, characterized the habits, &c. of sheep in general.

The Dishley is an improved breed of sheep, which is readily distinguished from the other long-wooled kinds, according to Culley, by having fine lively eyes; clean heads, without horns; straight, broad, flat backs; round or barrel-shaped bodies; fine small bones; thin pelts, and a disposition to make fat at an early age; to which may be added a superiority in the fineness of the grain and the flavour of the mutton to that of other sheep of the large long-woolled kinds. The weight per quarter in ewes three or four years old, from 18 to 26lbs.; in wethers of two years old, from 20 to 30lbs.; the length of wool from six to fourteen inches. But the author of the "Treatise on Live-Stock," characterizes them as having a fullness of form, and substantial width of carcase, with a peculiar plainness and meekness of countenance; the head long and thin, and leaning backwards; the nose projecting forward; the ears somewhat long, and standing backward; great fullness of the fore-quarters; legs of moderate length, and the finest bone; tail small; fleece well covering the body, of the shortest and finest of the combing wools, the length of staple six or seven inches. The fore-flank, a term of the old school, current in the time of Lisle, or that flap of skin and fat appended to the ribs, and the inferior part of the shoulder, is remarkably capacious in this breed. New-Leicester mutton, it is believed, is the most finely grained of all the large long-woolled species, but of a flavour bordering on the insipid. And it is added, that it is reported, and with the strongest probability, from the appearance of the stock, the fineness of the wool, and the grain of the mutton, that a Rye-land cross was a prime instrument in the Dishley improvement of sheep. Probably the root or foundation was Lincoln. In the ordinary and gradual course of improvement or alteration of form, it must have taken, it is thought, a long time and vast pains, to mould the animals into that artificial and peculiar shape which distinguishes this remarkable variety, unless indeed something nearly similar was suddenly and fortuitously chopped upon, as will occasionally happen when the fickle deity is good-humouredly disposed to spare our labours.

PLATE CCXXXI.—ORNITHOLOGY.

Land Birds. Order Picae. Genus Alcedo. Genus Galbula.

Genus Alcedo. Kingfisher.

This numerous genus appears to be dispersed over all parts of the Old and New Continent, as well as over the larger islands of both; but it is remarkable that one species alone is found in Europe. The Kingfishers in general are birds of an inelegant shape, but of singular brilliancy of plumage, in which the prevailing colours are blue, green, and orange. Some of the larger species however, are of rather obscure colours, exhibiting a mixture of brown, black, and white, variously modified in the different birds. In their manners they all seem to agree, frequenting rivers, sea-shores, and other watery places, and feeding principally on fish, which they watch, while sitting on the branches or other objects overhanging the water, and suddenly springing on their prey, snatch it out of the water, and after bruising it by repeated strokes of their bill, immediately swallow it. They deposit their eggs in cavities formed in the banks of rivers, and, in general, are supposed to lay from five or six to eight or nine eggs, which in the European Kingfisher are of a semitransparent white colour; the hole, or nest, if it may properly be so named, being often deeply lined at the bottom by a stratum of small fish-bones and scales. The flight of the Kingfisher is horizontal, and remarkably rapid.

The genus may be divided into long and short-tailed species; those of the latter division having that part extremely short, as in the common Kingfisher.

Fig. 1. *Crested Kingfisher. Alcedo Cristata*, Linn.

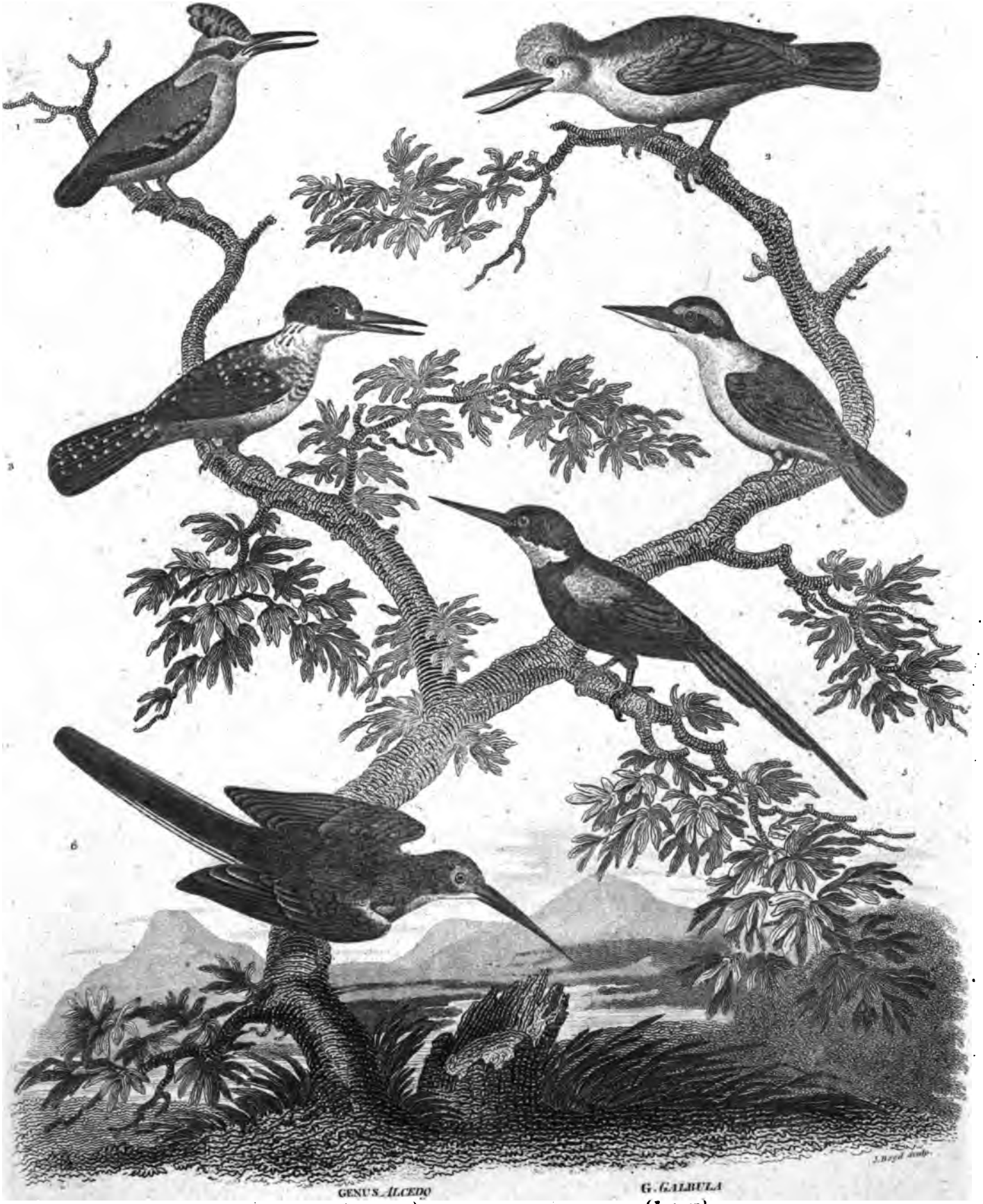
A species of singular brilliancy and elegance. It seems to have been first described by Edwards, whose specimen appears to have been of rather larger size than those of other authors, measuring about five inches and a half in length. Edwards describes it in the following manner. "The bill is straight, sharp-pointed, ridged both above and beneath, and of a blackish colour: from the lower mandible of the bill the throat is white, which whiteness passes round the neck, and forms a collar: the crown of the head is covered with long blue-green feathers variegated with black lines: these feathers being long and loose, form a crest which it is supposed the bird can raise or lower at pleasure: the feathers immediately above the eyes are blue: the hinder part of the neck, the back, rump, wings, and tail are of an exceeding fine ultramarine blue, the rump something lighter than the other parts: the tips of the quills are dusky: the inner covert-feathers of the wings orange-coloured: the quills within are dusky, with their edges of a faint orange-colour: the under side of the tail is dusky or blackish: the breast, belly, thighs, and covert-feathers under the tail are of a bright orange-colour: the legs and feet are made as in other Kingfishers, and of a red or scarlet colour: it was shot in the island of Johanna, to the northward of Madagascar."



Sydt. Edwards del!

P. Maverick sculp. N. York.

South Down Polled Sheep of the improved breeds. From the Stock of the late Duke of Bedford. Woburn.

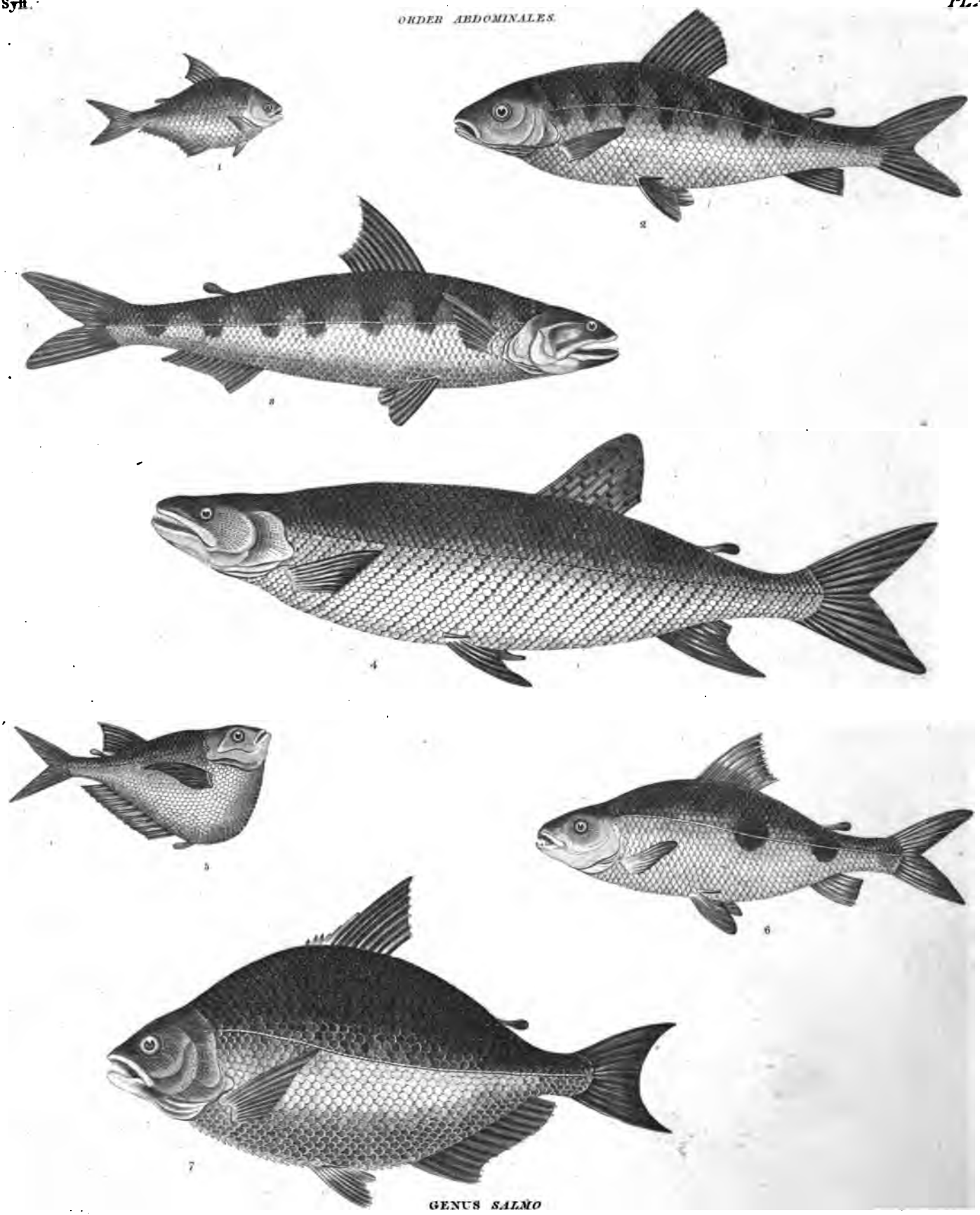


GENUS ALCEDO (Kingfisher)

1.A.*Cristata* CRESTED K. 2.A.*Venerata* VENERATED K. 3.A.*Alcyon* BELTED K. 4.A.*Sacra* SACRED K.

G. GALBULA (Jacamar)

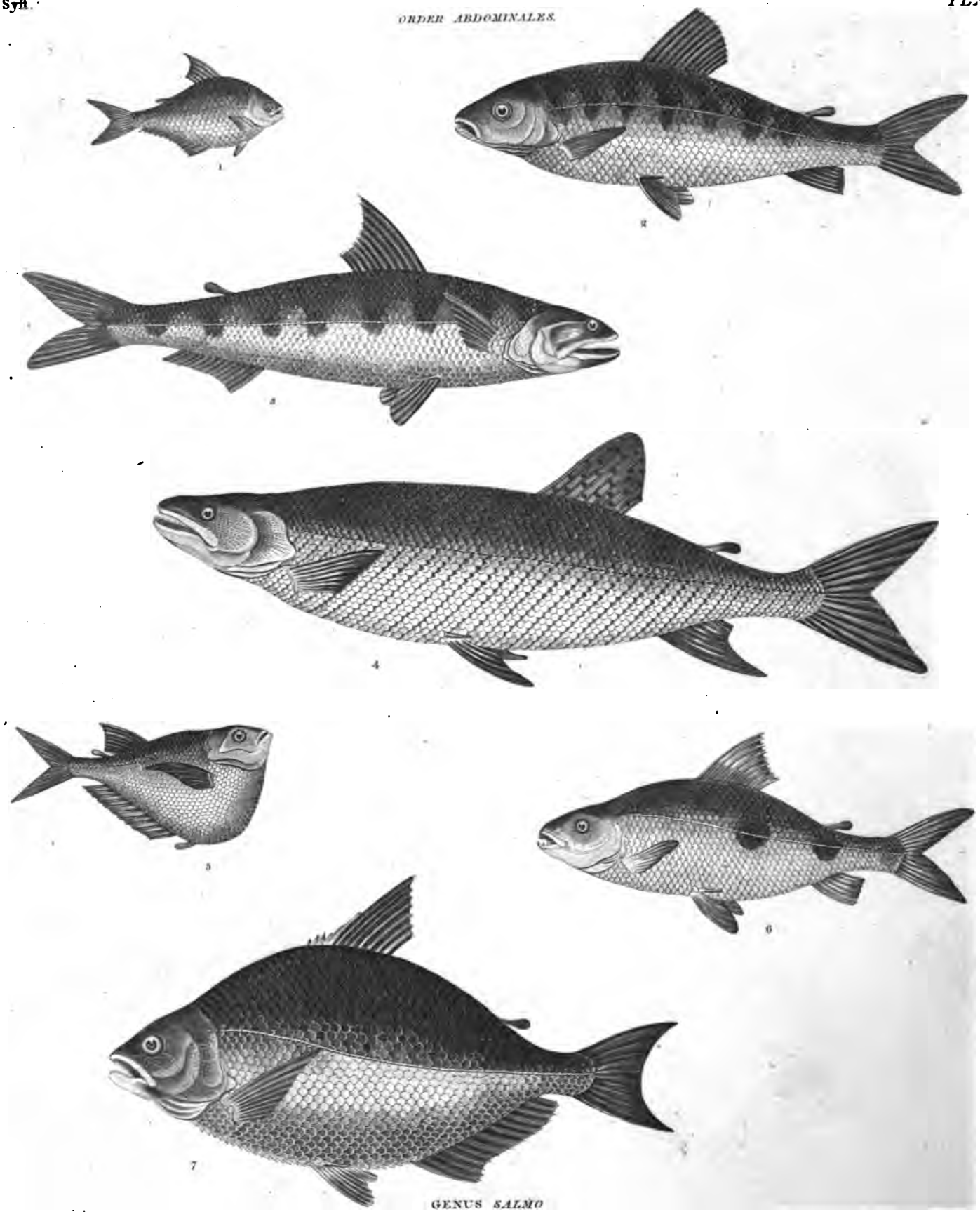
5.G.*Paradisea* PARADISE J. 6.G.*Viridis* GREEN J.



GENUS *SALMO*

(Salmon)

1. S. *Bimaculatus* _ 2. S. *Fasciatus* _ 3. S. *Tumbil* _ 4. S. *Odoe* _ 5. S. *Gasteropelecus* _ 6. S. *Friderici* _ 7. S. *Rhombeus*.



GENUS *SALMO*

(Salmon)

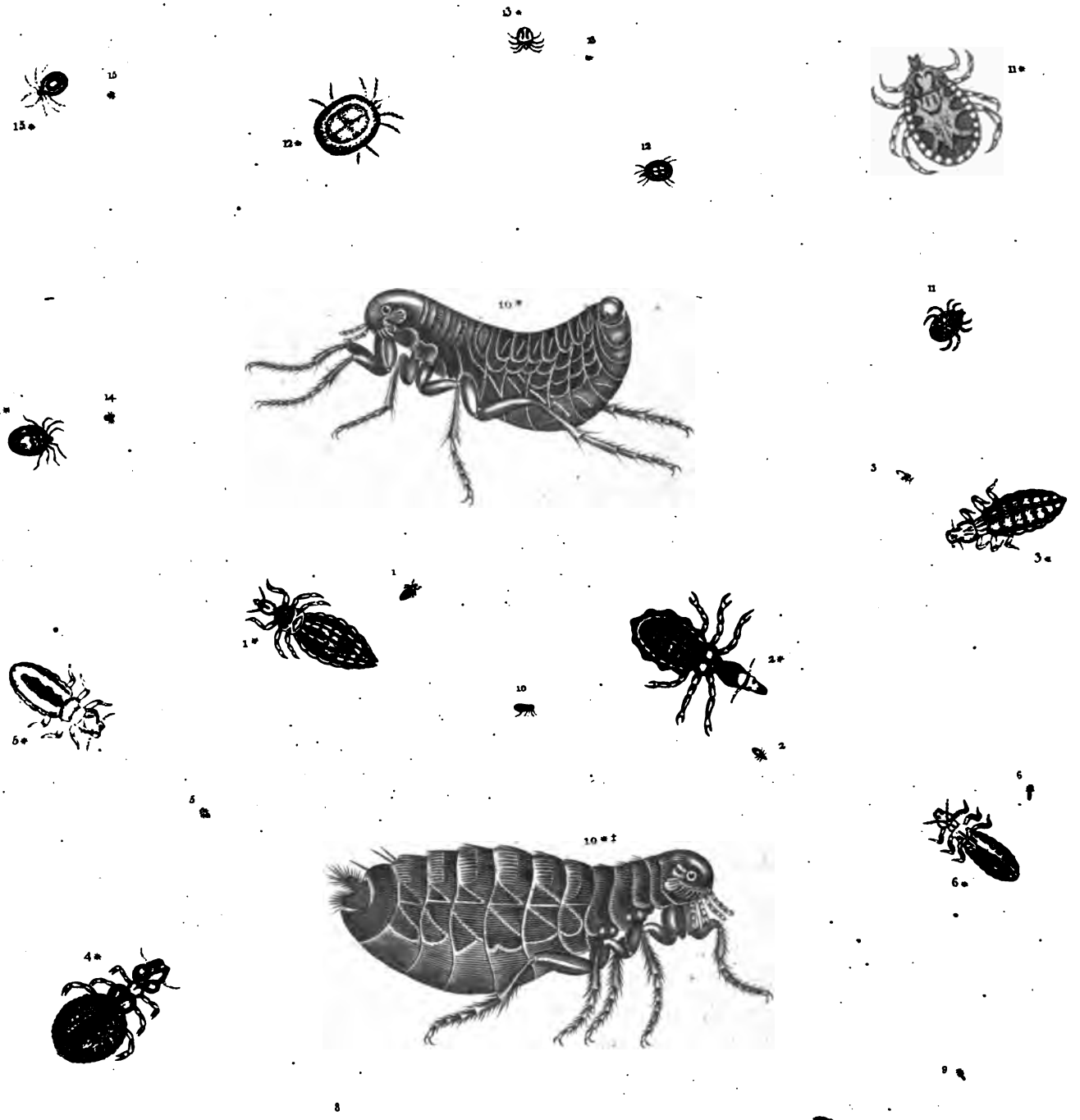
1. S. *Bimaculatus* — 2. S. *Fasciatus* — 3. S. *Tumbil* — 4. S. *Odoe* — 5. S. *Gasteropelecus* — 6. S. *Friderici* — 7. S. *Rhombeus*.

ENTOMOLOGY.

Order Aptera.

GENUS *PEDICULUS* _ G. *PULEX* _ G. *ACARUS* _ G. *FROMBIDIUM* _ G. *HYDRACHNA*.

(Louse) (Flea)



1 P. humanus
HUMAN L.
2 P. asini
ASS L.
3 P. cygni.
SWAN L.
4 P. corvi
CROW L.
5 P. picæ
MAGPIE L.
6 P. gruis
CRANE L.
7 P. columbæ
PIGEON L.
8 P. pluvialis
PLOVER L.
9 P. apis
BEE L.
10 Pu. irritans
FLEA
11 A. reduvius
12 F. aquaticum
13 F. abstergens
14 H. geographica
15 H. abstergens
* *magnified*
† *female*

Fig. 2. *Venerated Kingfisher. Alcedo Venerata*, Linn.

Length nine inches: upper parts of the body pale brown, but more or less glossed with green, especially along the sides of the head, forming a kind of zone: the wing-coverts, quills, and tail-feathers are also edged with green: the under parts of the body are whitish: the bill black, with the base of the lower mandible white; the legs dusky. Native of the Friendly Islands in the South Sea, where it is said to be held in veneration.

Fig. 3. *Belted Kingfisher. Alcedo Alcyon*, Linn.

Inhabits Hudson's Bay, Norton Sound, and Mexico. It is of a migratory nature: it is there considered as an edible bird, but is observed to have a rank or fishy flavour, like most other fish-eating birds. Like many others of this genus, the present species are observed to vary in different regions both in point of size and plumage: the abdomen in some is ferruginous, and in others the zone or band across the breast is of a mixed gray and chestnut-colour instead of plain; and lastly, the legs and lower mandible are in some dusky, and in others reddish.

Fig. 4. *Sacred Kingfisher. Alcedo Sacra*, Linn.

Found in many varieties, throughout the smaller scattered islands called the Society Isles in the South Sea, as well as in some parts of the vast island, or rather continent of New Holland. The crown of the head and upper parts are blue-green, palest on the lower and deepest on the upper parts of the back: the quills and tail dusky, with blue edges, appearing entirely blue when closed: over the eyes generally passes a ferruginous streak, bounding the green of the crown; the throat is white; the remainder of the under parts very pale ferruginous, passing upwards, in the form of a moderately broad collar, round the neck: the bill is dusky, the under mandible whitish towards the base: the legs blackish. In some specimens a dark or blackish streak or band passes from the angles of the bill through the eyes, encircling the crown; and in others the vent and thighs are dusky, the green on the upper parts darker, and the wings and tail deep blue. Specimens have also been observed in which the crown of the head, wings, and tail were of a very dark or blueish green, the wing-coverts alone being pale-blue.

Fig. 5. *Paradise Jacamar. Galbula Paradisæa*, Linn.

Fig. 6. *Green Jacamar. Galbula Viridis*, Linn.

The Jacamars all inhabit the warmer regions of America: the propriety of removing them from the great scansorial group of authors, and associating them with the Kingfishers, cannot be disputed, as they have not only a decided affinity to these birds, but also with the Meropidæ: thereby admirably uniting the two conterminous fissirostral groups.

Sp. 1. Ga. Paradisæa. *Steph. v.* ix. *p.* 225.
Sp. 2. Ga. viridis. *Steph. v.* ix. *p.* 223. *pl.* 39.
Sp. 3. Ga. rubricollis. *Steph. v.* ix. *p.* 224.
Sp. 4. Ga. albirostris. *Steph. v.* ix. *p.* 226.
Sp. 5. Ga. ceycoides. *Zool. Journ.* (*Such.*) ii. 112.
Ga? *supra viridi-atra, subtus alba; capite, gulaque nigro-brunneis ochraceo-lineatis; abdominis lateribus crissoque nigro-fuscis; pedibus tridactylis.*
Jacamar? above dark-green, beneath white; with the head and throat black-brown striped with ochraceous; the sides of the abdomen and the vent black-brown; the feet three-toed.

Length, from the forehead to the tip of the tail, five inches and a half: head black-brown; with the frontal feathers ochraceous; those of the crown and cheeks black-brown dashed with ochraceous in the middle: those of the throat ochraceous striped with brown: the quills are greenish-brown, paler beneath, with the inner webs whitish at the base: the tail-feathers are dark green, brown beneath, margined at the tip with a very narrow rufous band: beak and legs black. This anomalous but interesting species was discovered by Dr. Such, in Brazil, and described by him as above quoted. It beautifully unites the Jacamars with the Kingfishers, and may probably at some future period be elevated to the rank of a distinct genus, with as much propriety as the preceding genus has been detached from the Kingfishers.

PLATE CCXXXII.—ICHTHYOLOGY.

The Linnean genus Salmo (Salmon), has a smooth and compressed head, and a large mouth; the lips are small, the tongue white, cartilaginous and moveable; the eyes are lateral; both jaws and tongue are furnished with teeth; gill-membrane from four to twelve-rayed, body covered with finely striated scales: the hindmost dorsal fin is fleshy; the ventral fins have many rays.

The habits of the Salmon are very peculiar. It is bred in rivers, but goes annually thence into the sea, while at certain seasons of the same year, it always returns again into fresh water: yet what is remarkable, so far as observation has traced them at any time, the same shoals of Salmon always return into the same river out of which they swam; so that the people who live on the Salmon fishery, know to a certainty that the shoals on which they depend, will not go elsewhere. When a Salmon has entered a fresh river, he always ascends it against the stream, and therefore swims as near the bottom as possible. They will go 100 leagues up large rivers, springing over cataracts many feet high.

Fig. 1. *Salmo bimaculatus*, Linn. A compressed fish. The anal fin is 32-rayed. Inhabits South America.

Fig. 2. *Salmo fasciatus*, Linn. With triangular blackish dorsal spots.

Fig. 3. *Salmo tumbil*, Linn. With an elongated body, and blackish dorsal spots.

Fig. 4. *Salmo odoe*, Linn. With a small head, compressed body, and reticulated silvery scales.

Fig. 5. *Salmo gasteropelecus*, Linn. The ventral and fleshy fins are very small. It inhabits Amboyna and other parts of India.

Fig. 6. *Salmo Frederici*, Linn. A broad fish, with two large black spots on the side, behind the dorsal fin.

Fig. 7. *Salmo rhombeus*, Linn. The belly of this species is serrate: the anal and caudal fins are black. Inhabits Surinam.

PLATE CCXXXIII.—ENTOMOLOGY.

The Genus *Pediculus*, well known by the vernacular name of *Louse*, belongs to the Linnean order *Aptera*. It has a mouth with a retractile, recurved sucker, without proboscis: the antennæ are as long as the thorax; it has two eyes, a depressed thorax, and six legs.

These insects live upon the animal juices of living bodies: some infest quadrupeds, some birds, and others again attach themselves to other insects.

Fig. 1. & 1*. *Pediculus humanus*, Linn. *Human louse.* It is produced from a small oval egg, called a *nit*, which is agglutinated by its smaller end to the hair on which it is deposited. From this egg comes the insect, complete in all its parts.

Fig. 2. & 2*. *Pediculus asini*, Linn. Head projecting and obtuse: legs cheliform. Infests the body of the Ass.

Fig. 3. & 3*. *Pediculus cygni*, Linn. Head emarginate, body ovate. Is found on the Swan.

Fig. 4. & 4*. *Pediculus corvi*, Linn. Abdomen ovate, with a striated margin. Found on various species of the crow.

Fig. 5. & 5*. *Pediculus picæ*, Linn. Head obtuse, brown, with four black dots. Found on the Magpie.

Fig. 6. & 6*. *Pediculus gruis*, Linn. Abdomen pale, with snowy spiracles. Found on Storks and Herons.

Fig. 7. & 7*. *Pediculus columbæ*, Linn. Body ferruginous and filiform. Found on the common pigeon.

Fig. 8. & 8*. *Pediculus Charadrii vel pluvialis*, Linn. Found on the Golden Plover.

Fig. 9. & 9*. *Pediculus apis. Bee louse.* Infests the domestic bee.

The genus Pulex, the *Flea*, has a mouth with a long inflected proboscis, covered at the base with two ovate laminæ: the sheath is 2-valved, 5-jointed, and conceals a single bristle; lip rounded, and fringed with reflected prickles: antennæ projecting, moniliform; the abdomen is compressed, and it has six legs formed for leaping.

Fig. 10. 10*, & 10†. *Pulex iritans*, Linn. *Common Flea.*

The genus Acarus or *Tick*, has no proboscis; the sucker is included in a bivalve, cylindric sheath; feelers two, and equal; two eyes, and eight legs.

Fig. 11. & 11*. *Acarus reduvius*, Linn.

The genus Trombidium has salient palpi, pointed at the end, with a moveable appendage under the extremity, and two eyes, each placed on an immoveable pedicle.

Fig. 12. & 12* *Trombidium aquaticum*, Linn.

Fig. 13. & 13*. *Trombidium abstergens*, Linn.

In the genus Hydrachna the mouth is composed of laminæ, forming a projecting sucker; it has a moveable appendage under each extremity of the palpi.

Fig. 14, & 14*. *Hydrachna geographica*, Linn.

Fig. 15. & 15*. *Hydrachna abstergens*, Linn.

PLATE CCXXXIV.—ENTOMOLOGY.

The genus of insects called Coccinella, is characterized by clavated antennæ; anterior feelers hatchet-shaped, posterior filiform; thorax and wing-cases margined; the body hemispherical, and the abdomen flat beneath.

These insects are generally found on plants, and they subsist chiefly on the *aphides*, or lice that feed on these vegetables. The larvæ are a lively race, of an elongated figure, and elongated towards the tail: the head is scaly, but the rest of the pupa is naked.

Fig. 1. *Coccinella sex-decem guttata.*

Fig. 2. *Coccinella oblongo-guttata*, Linn.

Fig. 3. *Coccinella decem-pustulata*, Linn.

Fig. 4. *Coccinella frontalis*, Linn.

Fig. 5. *Coccinella decem-punctata*, Linn.

Fig. 6. *Coccinella viginta-duo punctata*, Linn.

Fig. 7. *Coccinella septem-notata*, Linn.

Fig. 8. *Coccinella quatuor-pustulata*, Linn.

Fig. 9. *Coccinella punctata*, Linn.

Fig. 10. *Coccinella analis*, Linn.

Fig. 11. *Coccinella parvula*, Linn.

Fig. 12. *Coccinella sex-pustulata*, Linn.

PLATE CCXXXV.—CONCHOLOGY.

This plate is designed to illustrate the terms in use among Conchologists, to designate the parts of univalve shells.

Fig. 1. In every instance represents the *base* of a shell, which is sometimes broad, as in *Patella*, or circumscribed, as in *Dentalium.*

Fig. 2. Represents the *apex*, which in some shells is sharp, in others obtuse.

Fig. 3. Is the *front* of a shell, or that portion which is on a line with the aperture.

Fig. 4. Represents the *back* of the shell.

Fig. 5. Represents the *sides.*

Fig. 6. Is the *body*, or that part on which the *spire* is supported.

Fig. 7. Is the *venter*, or most ventricose part of the shell.

Fig. 8. Is the *whorl*, or one of the many divisions of which the spire is composed.

Fig. 9. Is the *spire*, formed of the *whorls* collectively.

Fig. 10. Is the *suture*, or point of junction between two whorls.

PLATE CCXXXVI.—VERMES.

Every one is more or less familiar with the Tænia or *Tape-worm*, which infests the bowels of the human species. It is chiefly found in the stomach, occasioning great distress, and being extremely difficult to expel.

Naturalists have distinguished two species of them in the human body of which figures are given on the annexed plate.

Fig. 1. *Tænia solium*, Linn. and Cuv. Grouped into folds in order to include the whole animal, which is of extreme length.

Fig. 2. The head, natural size.

Fig. 3. Head magnified.

Fig. 7. Two joints retaining the external skin, and showing the alternate disposition of the *oscula* or pores along the edges of the joints, as they usually appear.

Fig. 8. Two joints showing their lateral disposition when they occur on both the margins of each joint, which sometimes happens.

Fig. 4. A portion of the joints of the natural size, divested of the outer skin, and exposing more fully the alternate lateral oscula, together with the alimentary canals, as they communicate from one joint to the other.

Fig. 5. The middle system of vessels, illustrated in another portion of four joints.

Fig. 6. Another portion deprived of the outer skin, and displaying all the canals in their relative position.

Fig. 10. & 11. *Tænia lata*, Linn. *Tænia vulgaris.*

Fig. 10. Shows several joints with their oscula, the latter being arranged in single series down the centre of the joints.

Fig. 11. Shows a portion with the outer skin removed, the stelliform vessels of the centre exposed, together with the lateral alimentary canals.

Fig. 9. *Tænia canina*, Linn. Head and portion of the body, consisting of the first five joints. Found in the Dog.

PLATE CCXXXVII.—ZOOPHYTES.

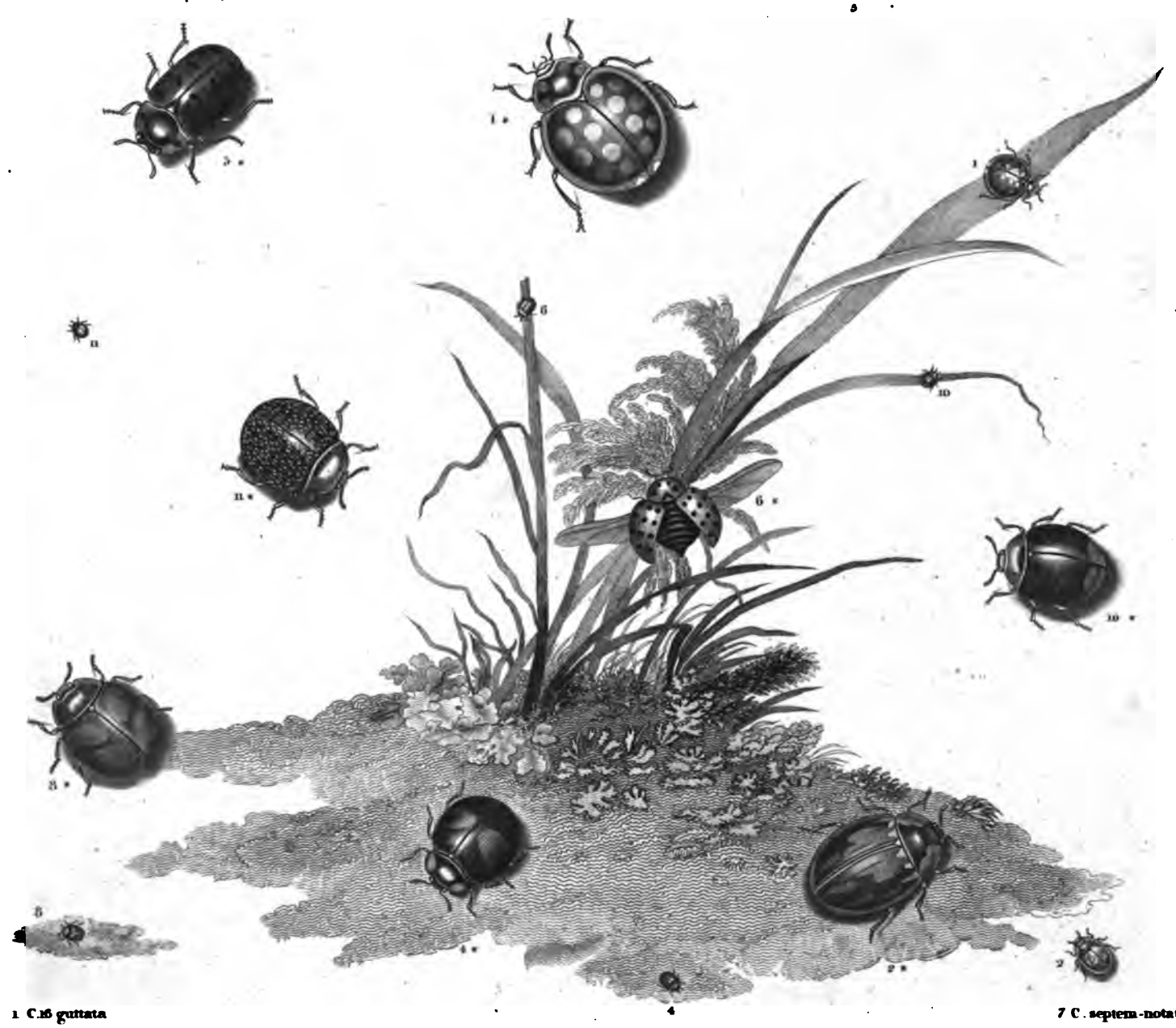
The genus Antipathes of Linneus, is characterized by the animal growing in the form of a plant: stem within horny, with small spines; base expanded; the outside covered with gelatinous flesh, and numerous polypiferous warts.

The bark which envelops the different species of this genus is so soft that it becomes destroyed after death, when it resembles branches of dry wood.

ENTOMOLOGY.

Linn. Syst. — Order Coleoptera. — *PLATE 231.*

GENUS *COCCINELLA.*



1 C.16 guttata
2 C. oblongo-guttata
3 C.12 pustulata
4 C.frontalis
5 C.12 punctata
6 C.20 punctata
* *magnified*

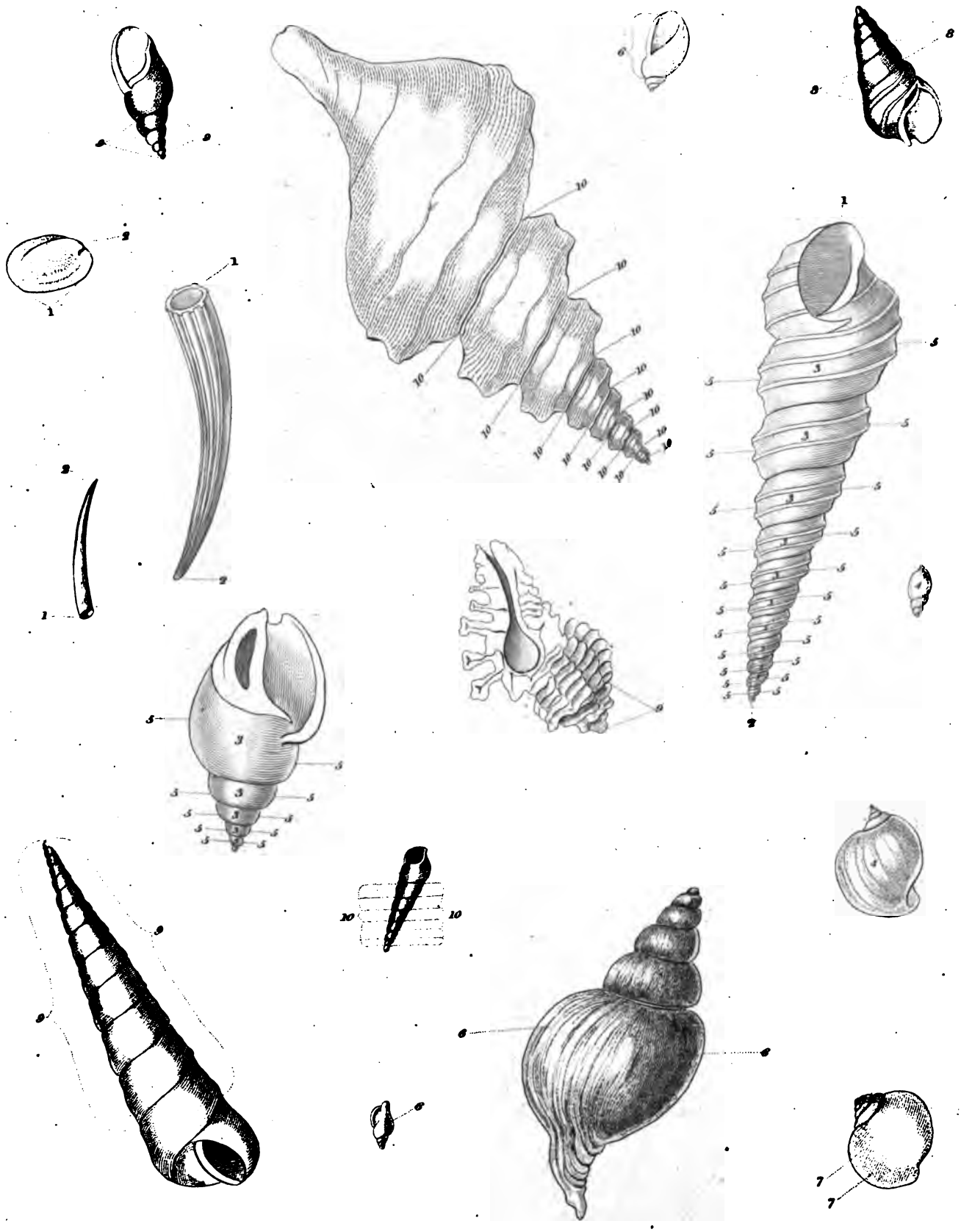
7 C. septem-notata
8 C.4 pustulata
9 C.punctata
10 C. analis
11 C.parvula
12 C.6 pustulata

W. H. Hay Sc.

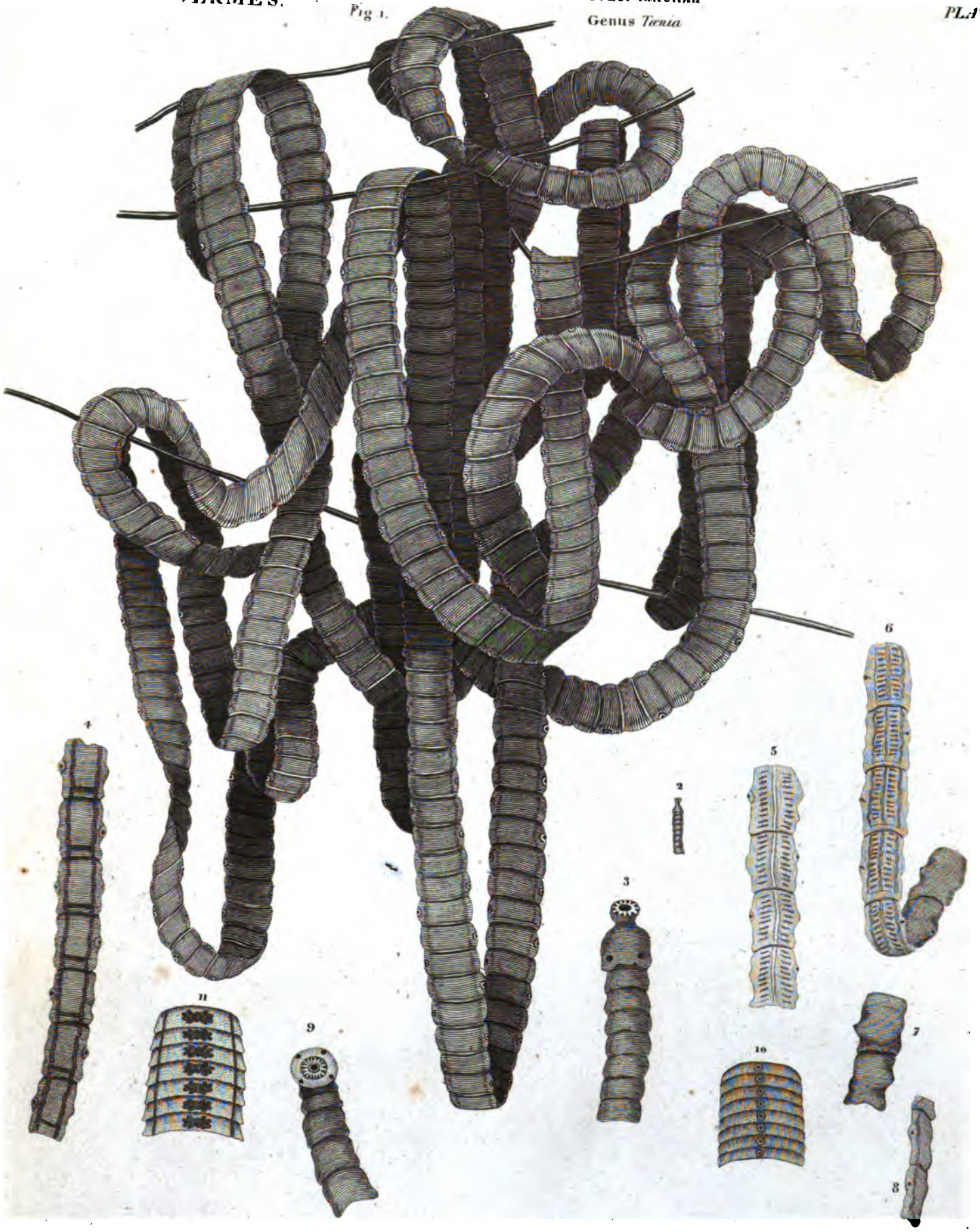
CONCHOLOGY.

Elementary.

UNIVALVE.



1 Base. 2 Apex. 3 Front. 4 Back. 5 Sides. 6 Body. 7 Belly. 8 Whorl. 9 Spire. 10 Suture of the Spire or Whorl.


4
11
9
2
3
5
6
10
7
8



I. Coccinea



I. Hippuris



magnified

A. Subpinnata



magnified

A. Myriophylla

GEOLOGY.

Sir H. Davy's Wire gauze Safety Lamp.
as made by M^r. Newman, Lisle Str. Leicester Sq.
see **WIRE GAUZE.**

see Dip, Dyke, Fault, Slip, Trouble &c, in the Article COAL.

Fig. 1.

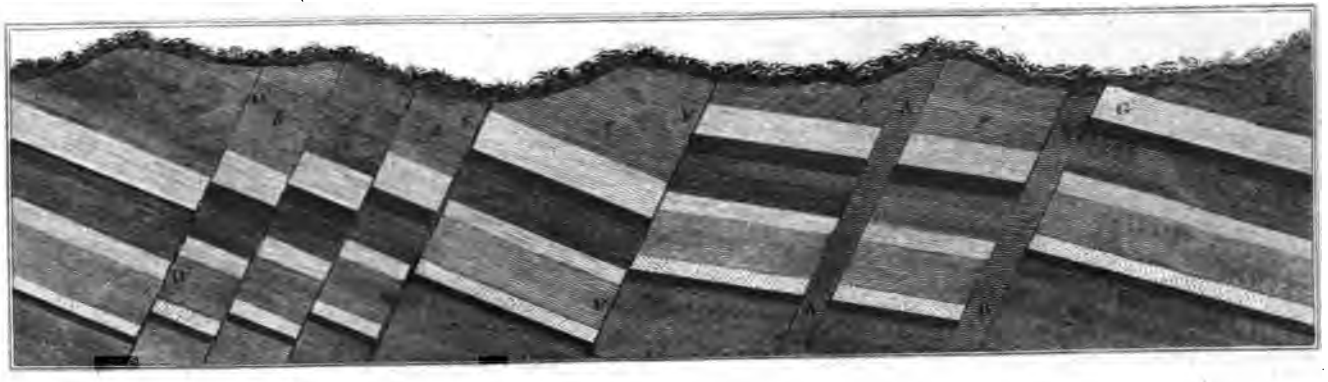
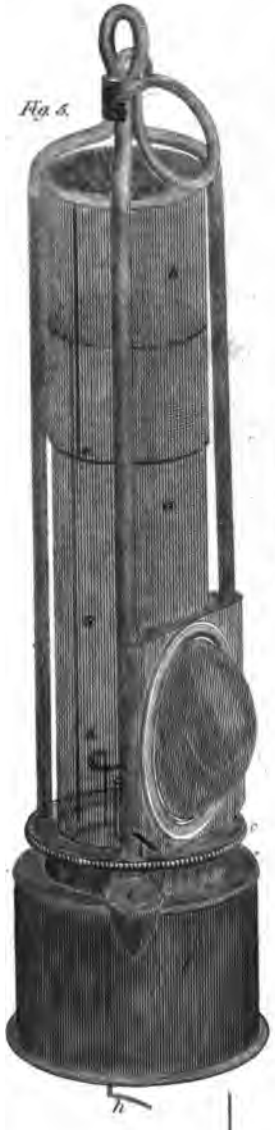


Fig. 5.



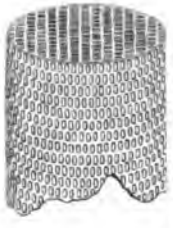
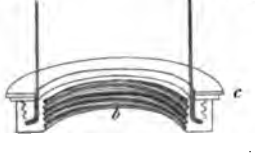


Fig 6



D^r Clanny's Safety Lamps

Fig. 2.

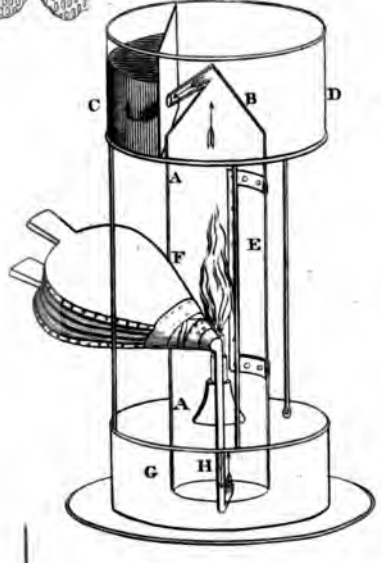
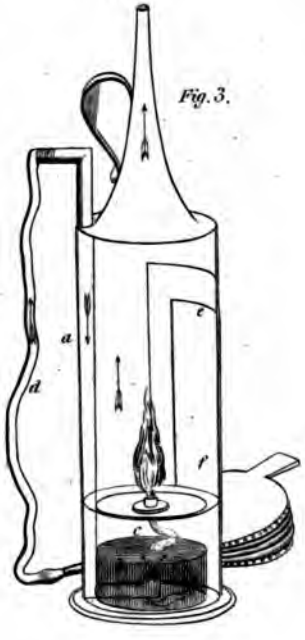


Fig. 3.



D^r Clanny's Steam Safety Lamp.

Fig. 4.



With the foregoing we close our descriptions of the plates of the "Book of Nature," but must not omit again acknowledging our obligations to the various authorities on subjects of natural history whose works we have consulted, and whose labours we have brought in various shapes to enhance the value of these pages. It was announced in the outset that our labours would consist very much in condensing the information of others rather than in imparting new information: this was to be expected from the nature of the work undertaken by the editors, which, embracing the whole range of natural history, required no little labour and research, as well as assistance from many hands.

The work, so far as the description of the given number of plates is concerned, is now brought to a close, and a brief space being left, we shall occupy it in a few popular extracts on that most interesting topic, ornithology. The following particulars are furnished by Professor Rennie in his very entertaining volume entitled "The Architecture of Birds," a neat edition of which was published recently in Boston, and being thus easily accessible, we use the present occasion of recommending it, together with the continuation of the same series on insects, to the perusal of the young naturalist.

Tailor-Birds.—*Orchard Starling. Bonana Starling. Tailor-Bird.*

It seems no less difficult to conceive in what manner a bird could make its bill perform the office of a needle, than that of a weaver's shuttle; yet that this is actually done, we have unquestionable evidence, both in the workmanship of the nests of more than one species, and in the ocular testimony of observers who have watched the little mechanics at work. We are, however, more deficient in details upon the process of forming nests by sewing, than in the case of most of the other mechanical operations of birds. The most perfect of these descriptions is given by Wilson, respecting the nest of the orchard starling (*Icterus mutatus*,) a bird which has created no small confusion among systematic writers, in consequence of the male not arriving at its mature plumage till the third summer, which circumstance has caused it to be mistaken by Buffon and Latham for the female of the Baltimore, (*Icterus Baltimore.*) Wilson has cleared up these mistakes in a luminous and satisfactory manner, by coloured figures of the female as well as of the male in its three different gradations of plumage; while the nest is so very different in structure, that we have deemed it proper to place them in separate chapters.

"These birds," (the orchard starlings,) says Wilson, "construct their nests very differently from the Baltimores. They are so particularly fond of frequenting orchards, that scarcely one orchard in summer is without them. They usually suspend their nest from the twigs of the apple-tree, and often from the extremities of the outward branches. It is formed exteriorly of a particular species of long, tough, and flexible grass, knit or sewed through and through in a thousand directions, as if actually done with a needle. An old lady of my acquaintance, to whom I was one day showing this curious fabrication, after admiring its texture for some time, asked me in a tone between joke and earnest, whether I did not think it possible to learn these birds to darn stockings? This nest is hemispherical, three inches deep by four in breadth; the concavity scarcely two inches deep by two in diameter. I had the curiosity to detach one of the fibres, or stalks, of dried grass from the nest, and found it to measure thirteen inches in length, and in that distance was thirty-four times hooked through and returned, winding round and round the nest! The inside is usually composed of wool, or the light downy appendages attached to the seeds of the platanus occidentalis, or buttonwood, which form a very soft and commodious bed. Here and there the outward work is extended to an adjoining twig, round which it is strongly twisted, to give more stability to the whole, and prevent it from being overset by the wind.

"When they choose the long pending branches of the weeping willow to build in, as they frequently do, the nest, though formed of the same materials, is made much deeper, and of slighter texture. The circumference is marked out by a number of these pensile twigs that descend on each side like ribs, supporting the whole; their thick foliage, at the same time, completely concealing the nest from view. The depth in this case is increased to four or five inches, and the whole is made much slighter. These long pendent branches, being sometimes twelve and even fifteen feet in length, have a large sweep in the wind, and render the first of these precautions necessary, to prevent the eggs or young from being thrown out; and the close shelter afforded by the remarkable thickness of the foliage is no doubt the cause of the latter. Two of these nests, such as I have here described, are now lying before me, and exhibit not only art in the construction, but judgment in adapting their fabrication so judiciously to their particular situations. If the actions of birds proceeded, as some would have us believe, from the mere impulses of that thing called instinct, individuals of the same species would uniformly build their nest in the same manner, wherever they might happen to fix it; but it is evident from these just mentioned, and a thousand such circumstances, that they reason, *à priori*, from cause to consequences, providently managing with a constant eye to future necessity and convenience."

According to Buffon and Latham, the bonana starling (*Icterus bonana*) is another of the tailors. It inhabits Martinico, Jamaica, and other West India islands, and builds a nest of a very curious construction, if it can justly be called building. The materials which it uses are fibres and leaves, which it shapes into the fourth part of a globe, and sews the whole, with great art, to the under part of a bonana-leaf, so that the leaf makes one side of the nest.

But the most celebrated bird of this division is the one which in the east is, *par excellence*, named the tailor-bird (*Sylvia sutoria*, Lath.) the description of whose performances we would be apt to suspect for an oriental fiction, if we had not a number of the actual specimens to prove their rigid authenticity. We do suspect, however, that these very specimens have misled European naturalists a step beyond the truth in their accounts of its proceedings. "The tailor-bird," says Darwin, "will no



Nest of the Tailor Bird.

trust its nest to the extremity of a tender twig, but makes one more advance to safety by fixing it to the leaf itself. It *picks up a dead leaf, and sews it to the side of a living one*, its slender bill being its needle, and its thread some fine fibres; the lining consists of feathers, gossamer, and down; its eggs are white; the colour of the bird light yellow; its length three inches; its weight three-sixteenths of an ounce; so that the materials of the nest, and the weight of the bird, are not likely to draw down a habitation so slightly suspended. A nest of this bird is preserved in the British Museum."

There are now three such nests in the Museum, all of which certainly give some colour to the story of a dead leaf having been sewed to a living one; yet we have the authentic narrative of an eye-witness of its operations, which mentions nothing of this kind, but, on the contrary, serves to confirm our doubts. It will consequently be desirable to give this narrative in the language of the original observer. Comparing it with the baya, he says, "Equally curious in the structure of its nest, and far superior in the variety and elegance of its plumage, is the tailor-bird of Hindostan; so called from its instinctive ingenuity in forming its nest: it first selects a plant with large leaves, and then gathers cotton from the shrub, spins it to a thread by means of its long bill and slender feet, and then, as with a needle, sews the leaves neatly together to conceal its nest. The tailor-bird (*Motacilla sutoria*, Linn.) resembles some of the humming-birds at the Brazils, in shape and colour; the hen is clothed in brown; but the plumage of the cock displays the varied tints of azure, purple, green, and gold, so common in those American beauties. Often have I watched the progress of an industrious pair of tailor-birds, in my garden, from their first choice of a plant, until the completion of the nest and the enlargement of the young. How applicable are the following lines, in the 'Musæ Seatonianæ,' to the nidification of the tailor-birds, and the pensile nests of the baya:—

> 'Behold a bird's nest!
> Mark it well, within, without!
> No tool had he that wrought; no knife to cut,
> No nail to fix, no bodkin to insert,
> No glue to join: his little beak was all:
> And yet how neatly finish'd! What nice hand,
> With every implement and means of art,
> Could compass such another?'"

Besides so many of our own birds which may appropriately be said to weave the materials of their nests, at least on the inside, more foreign birds do so than it would be interesting to enumerate. Amongst the more remarkable of these, is that singular bird the mountain ant-catcher (*Myiothera obsoleta*, Bonaparte,) which weaves a hemispherical structure of dry grass, the blades of which it winds round the adjacent branches of a tree. The American king-bird (*Tyrannus intrepidus*, Vieill.) first forms a sort of basket frame-work of slender twigs, and the withered flower tops of the rose yarrow (*Achillea asplenifolia*, Pers.) and other plants, which are afterwards woven together with wool and tow, and lined with interweavings of hair and dry fibrous grass. A bird of the same family, the white-eyed fly-catcher (*M. cantatrix*, Bartram,) constructs a neat conical hanging nest, "suspended," says Wilson, "by the upper edge of the two sides, on the circular bend of a prickly vine, a species of smilax that generally grows in low thickets. Outwardly it is constructed of various light materials, bits of rotten wood, fibres of dry stalks of weeds, pieces of paper, commonly newspapers, an article almost always found about its nest, so that some of my friends have given it the name of the politician; all these substances are interwoven with the silk of caterpillars, and the inside is lined with fine dry grass and hair." The hooded fly-catcher (*M. cucullata*, Wilson,) instead of spiders' web for a binding material, uses flax and fibres of hemp to interweave with moss. The pine-creeper (*Sylvia Pinus*) uses both coarser and finer materials than this, suspending its nest, according to Abbot, from the horizontal fork of a branch, and forming it of slips of vine-bark and rotten wood, interwoven with caterpillars' webs and bits of hornets' nests, the interior being lined with pine-leaves and roots. A still prettier nest of the same materials, but more delicate from its very small size, as it weighs scarcely a quarter of an ounce, is made by the prairie warbler (*Sylvia minuta*, Wilson.)

But by far the most celebrated nest of this kind is that of the Baltimore starling (*Icterus Baltimore.*) Latham, differing materially from the admirable description of Wilson, says that "the nest is loosely constructed of some downy matter in threads, formed not unlike a purse, fastened to the extreme forks of the tulip, plane, or hickory tree." M. Montbeillard is still more brief in his notice of this interesting structure. We shall give Wilson's account entire.

"Almost the whole genus of orioles," says he, "belong to America, and, with a few exceptions, build pensile nests. Few of them, however, equal the Baltimore in the construction of these receptacles for their young, and in giving them, in such a superior degree, convenience, warmth, and security. For these purposes he generally fixes on the high bending extremities of the branches, fastening strong strings of hemp or flax round two forked twigs corresponding to the intended width of the nest; with the same materials, mixed with quantities of loose tow, he interweaves or fabricates a strong, firm kind of cloth, not unlike the substance of a hat in its raw state, forming it into a pouch of six or seven inches in depth, lining it substantially with various soft substances, well interwoven with the outward netting, and, lastly, finishes with a layer of horse-hair, the whole being shaded from the sun and rain by a natural penthouse, or canopy of leaves. As to a hole being left in the side for the young to be fed and void their excrements through, as Pennant and others relate, it is certainly an error: I have never met with anything of the kind in the nest of the Baltimore. Though birds of the same species have, generally speaking, a common form of building, yet, contrary to the usually received opinion, they do not build exactly in the same manner. As much difference will be found in the style, neatness, and finishing of the nests of the Baltimores as in their voices. Some appear far superior workmen to others, and probably age may improve them in this as it does in their colours. I have a number of their nests now before me, all completed and with eggs. One of these, the neatest, is in the form of a cylinder, of five inches diameter, and seven inches in depth, rounded at bottom. The opening at top is narrowed by a horizontal covering to two inches and a half in diameter. The materials are flax, hemp, tow, hair, and wool, woven into a complete cloth, the whole tightly sewed through and through with long horse-hairs, several of which measure two feet in length. The bottom is composed of thick tufts of cow-hair, sewed also with strong horse-hair. This nest was hung on the extremity of the horizontal branch of an apple-tree, fronting the south-east, was visible one hundred yards off, though shaded by the sun, and was the work of a very beautiful and perfect bird. The eggs are five, white, slightly tinged with flesh-colour, marked on the greater end with purple dots, and on the other parts with long hair-like lines, intersecting each other in a variety of directions. I am thus minute in these particulars from a wish to point out the specific difference between the true and bastard Baltimore, which Dr. Latham and some others suspect to be only the same bird in different stages of colour.

"So solicitous is the Baltimore to procure proper materials for his nest, that, in the season of building, the women in the country are under the necessity of narrowly watching their thread that may chance to be bleaching, and the farmer to secure his young grafts, as the Baltimore, finding the former, and the strings which tie the latter, so well adapted for his purpose, frequently carries off both; or should the one be too heavy, and the other too firmly tied, he will tug at them a considerable time before he gives up the attempt."

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